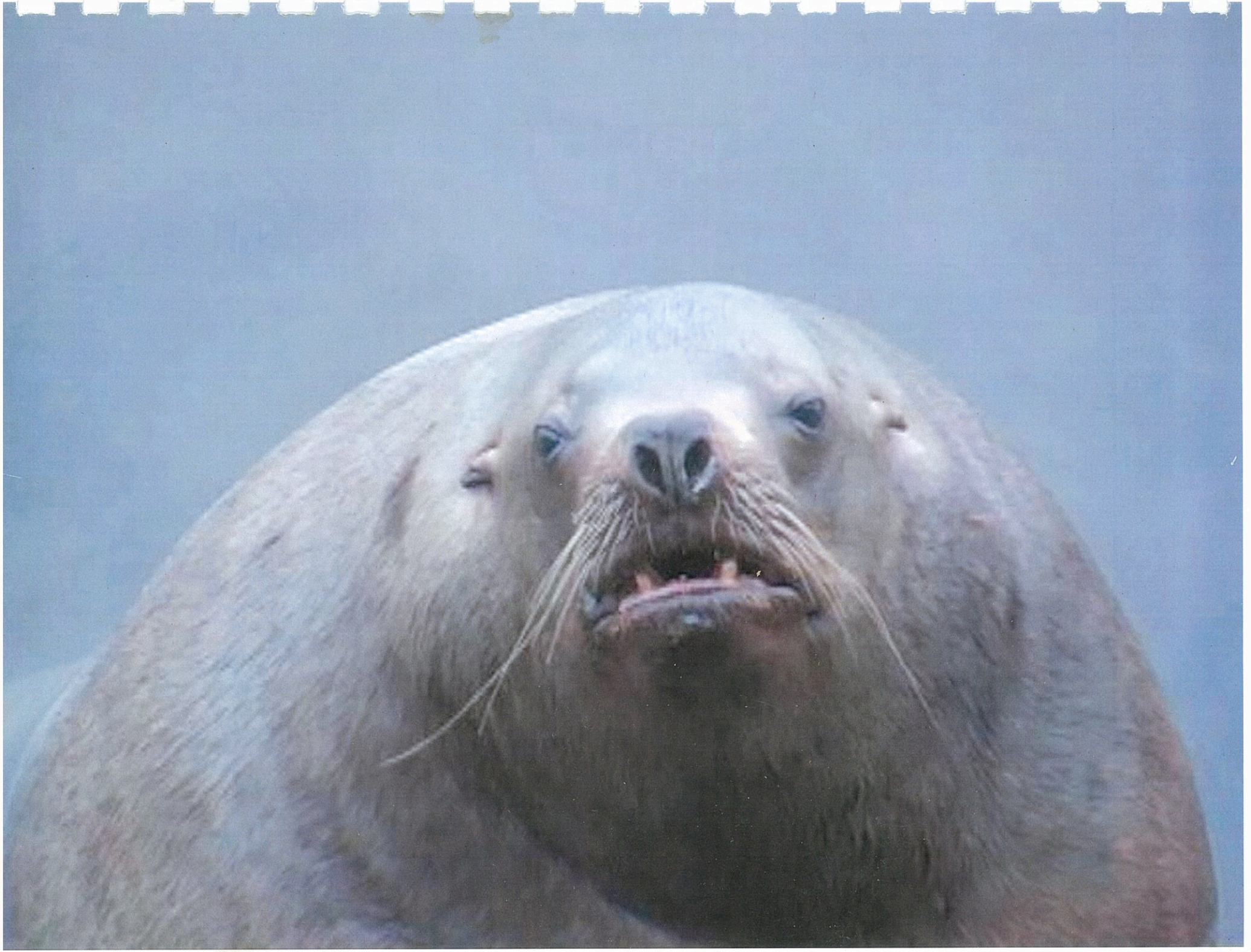

PHOTO ESSAY OF THE
TERRAIN ON THE
EASTSIDE OF LYNN CANAL



November, 2007

INTRODUCTION

With the use of the findings in the Golder Report manual, this photo essay was put together by Michael Miller and friends who are concerned about the DOT's plan to build a highway, linking Juneau to a new Ferry Terminal on the north side of the Katzehin River, near Haines, AK.

For the last decade, Ben Still, Will Wacker, Steve Cashen, Stephan Richie, Matt Champole, and Michael Miller have been climbing and exploring these secluded mountains that make up the east side of Lynn Canal.

The slopes above the proposed road are extremely steep and mountainous, with elevations that are typically 3,000ft to 6,000ft. The proposed road is sandwiched between tide-line and the base of the Kakuhan mountain range. The sixteen main, glacier covered mountains that make up this range, stretch from Berner's Bay to the Katzehin River Delta.

CONCERNS AND QUESTIONS:

-The biggest question here is: *Will* this highway provide improved and reliable transportation to Juneau?

-Is it in the public's best interest to build such an unpredictable and hazardous highway to a new ferry terminal, while we have a marine highway option?

-Is the DOT underestimating the true cost, feasibility, and scale of this project?

-Does the most recent cost estimate of this project include?

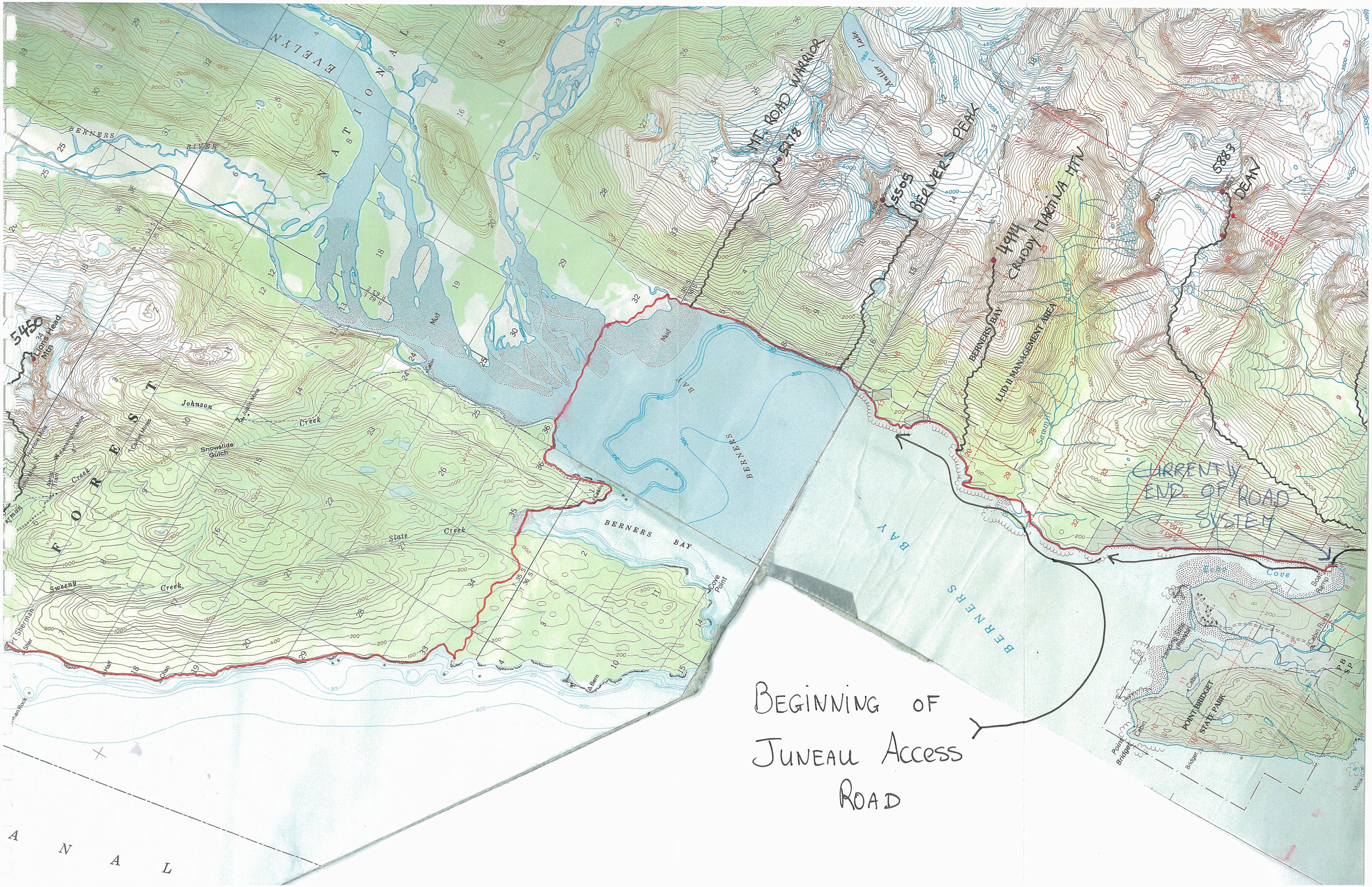
- snow sheds, bridges, and possible rock tunnels
- avalanche control such as: helicopters triggering avalanches, mounting of cannons up and down the fjord
- removal of avalanche debris, and plowing of snow and ice
- maintaining the 42 unpredictable debris flow hazards
- dealing with the numerous unpredictable rock fall hazards
- Is the maintenance of this proposed road far more involved than anyone can predict?
- Has there been any serious thought about highway safety, such as: highway patrol and ambulance service? Who's paying? Does this project have the communities'support?

-Habitat loss: The animals that live at the base of the Kakuhan range would have no opportunity to find new habitat because they live in the narrow strip of habitable terrain, between sub-alpine and the beach.

-If the cruise ship industry is able to move over 900,000 people through upper Lynn Canal in a few months, one would think that the State could provide affordable, reliable marine transportation for its communities.



THIS MAP REPRESENTS MOUNTAINS CLIMBED AND TRAVERSES ALONG PROPOSED ROAD


EVELYN
NATIONAL
FOREST
BERNERS RIVER
Mud
Johnson Creek
Snowslide Gulch
Sweeny Creek
Slate Creek
BERNERS BAY
Cove Point
Lion Head Mtn
5450
Mt. Roberts Tram
Perseverance Mine
Alaska Juneau Mine
Gastineau Mine
Ft. Sherman
Sitka
Half
Chan
Barn
Cabin
Main Rock
Mud
BERNERS BAY
Annex Lake
MT. ROBERTS
5018
BEANERS PEAK
5505
HEINI CANDY MARIJA MTN
5883
DEAN
BERNERS BAY
LUD II MANAGEMENT AREA
Spruce Pt.
Eagle Cove
Boat Ramp
Cabin Ruins
Campground
Pavilion
Cabin
POINT BRIDGET STATE PARK
Point Bridget
Bridget
PB SP
CURRENTLY END OF ROAD SYSTEM
BEGINNING OF JUNEAU ACCESS ROAD

MOUTAINS CLIMBED + ROUTES

SHORE LINE TRAVERSE (MILLER AND RICHIE MAY '05)

0 1 2 3 miles


KATZEHIN RIVER
KATZEHIN
FLATS
Dalton Creek
Mt Villard
4990
UNHOLY MOUNTAIN
5049
4780
DEVIL'S FIST
5900
TWIN HOOD
4760
Yeldagalga
NATIONAL FOREST BOUNDARY
KATZEHIN
SHORE LINE TRAVERSE
(WACKER AND MILLER
MAY '07)
PROPOSED NEW FERRY TERMINAL AND FERRY
Haines
SKAGWAY
CHILKOOT INLET
MOUNTAINS CLIMBED + ROUTES

View of Berner's Bay
from Peak 5278.
Beginning of Road.



View of backside of Kakuhan Mt. Range

Obviously, no potential for new habitat.



CLIMBER TRAVERSING STEEP TERRAIN IN BERNER'S BAY



Climbers on summit of Lion's Head Mtn.

Elevation 5450. Berner's Bay.

CLIMBING ROCK AND SNOW CHIMNEY ON LION'S HEAD MTN.



AREAL VIEW OF THE KAKUHAN MTN. RANGE, RISING 6,000 FT ABOVE PROPOSED ROAD.



Notes of interest from the Golder Report, and as observed by climbers who have spent over 45 days traversing, climbing, and exploring the unique east side of Lynn Canal:

- Mega-boulders and talus are widespread along the east side of Lynn Canal, and may present unique challenges to excavation, road construction, and hazard management.

- Typical mega-boulders range from 10ft to 20ft in diameter, with some boulders reaching 50ft in diameter.

- In some areas, mega boulders are so common that they form entire talus fields, often interlocked on steep slopes.

- Removal of mega boulders may present challenges to mechanical excavation by earth moving equipment.

- Large voids up to 6ft wide and 15ft deep are common between mega-boulders and mega talus, which may complicate fill and compacting of road.

- Because mega-boulders are so frequent and widespread in some areas, their appearance on geological maps indicate their presence, not necessarily their number.

- 81 unpredictable hazards
- 27 low predictable hazards
- 9 moderate predictable hazards
- 3 high predictable hazards

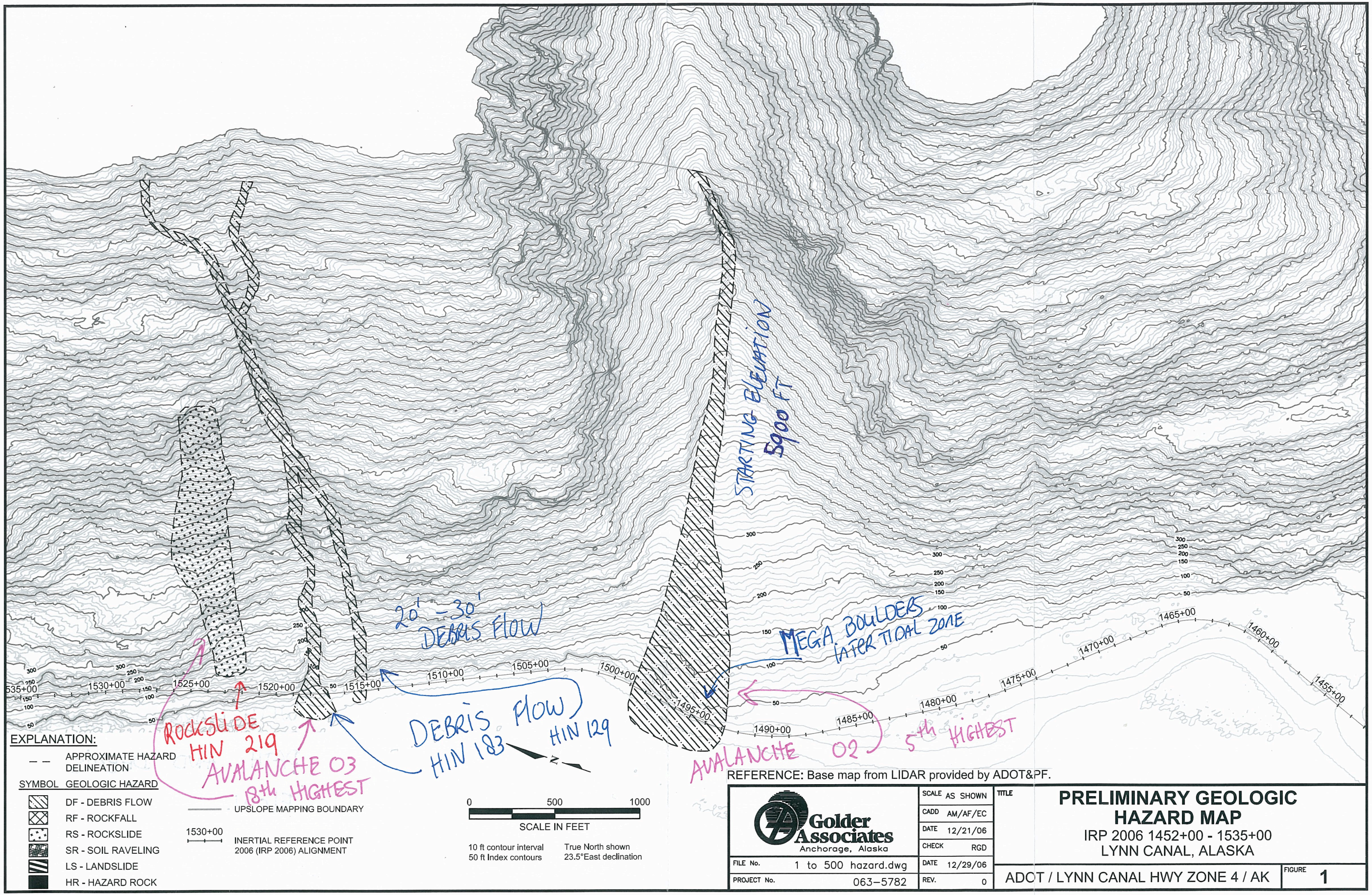
GEOLOGICAL HAZARD MAP

-Over the 22.2 miles of this map, there were:

- 52 catalogued rock fall hazard areas
- 42 debris flow hazards
- 5 hazard rocks
- 4 soil raveling hazard areas
- 4 translational sliding hazards
- 3 landslide hazards
- 2 rockslide hazards

-Cuts in talus pose the greatest potential for construction and operational hazards, and therefore they require more attention.

Each hazard map is followed by a series of photos that represent mountains, terrain, and hazards coordinating with that map. (Moving up the Canal from Berner's Bay to the Katzehin River Delta.)



REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782
SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

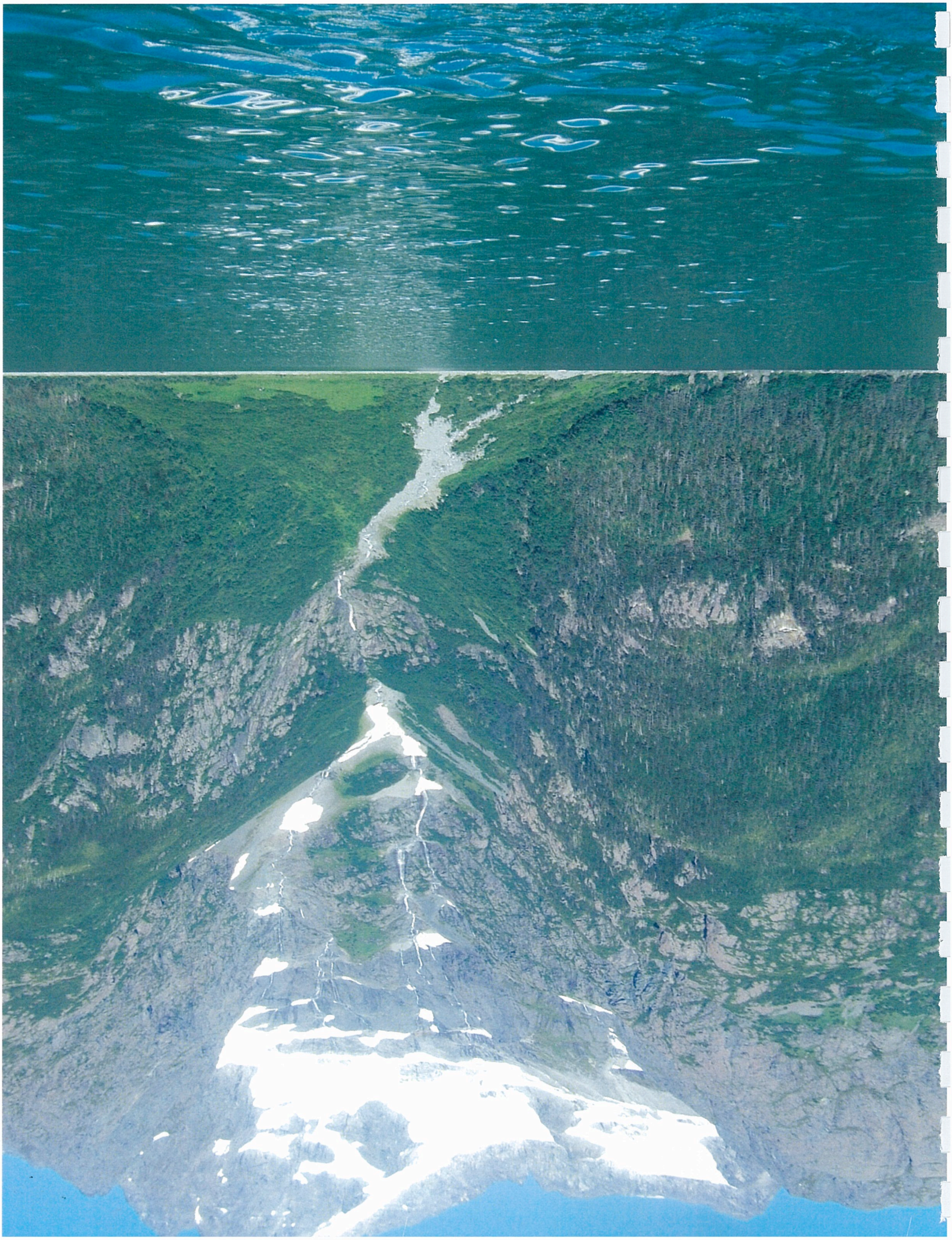
PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 1452+00 - 1535+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 1

Peak 5984.
With large avalanche path and debris flow.



CLIMBER ON SUMMIT OF PEAK 5984

DEBRIS FLOW DOWN TO BEACH


SAYULITA, NAYARIT

GIANT AVALANCHE CHUTE ON 5984, DIRECTLY OVER ROAD.

CLIMBER ON STEEP, UPPER SLOPE OF AVALANCHE PATH AND HANGING GLACIER.

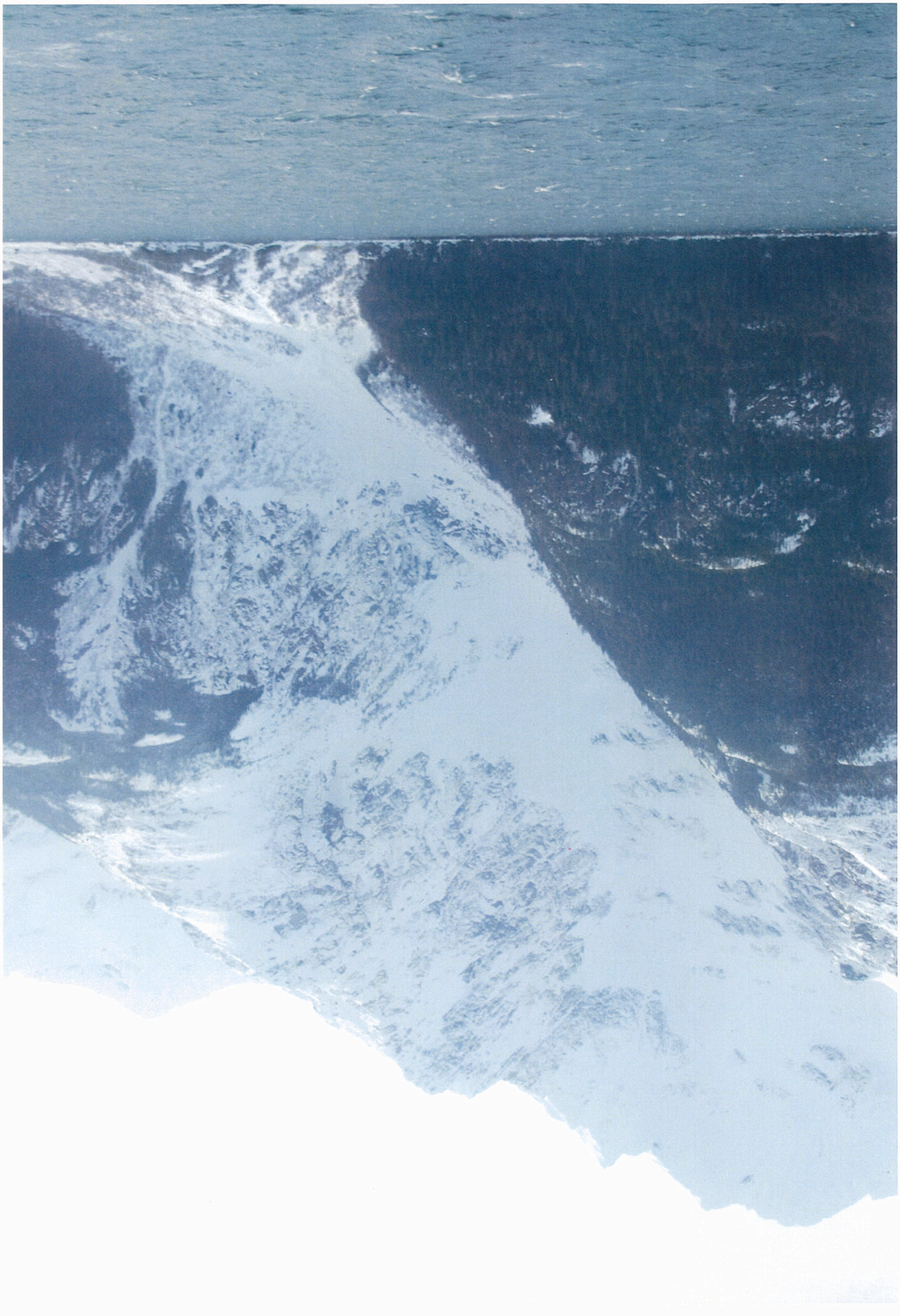


Early snowfall on Peak 5984,

Also the 5th largest avalanche path.

1.25 mi from summit to shore-line.

Extremely active terrain.



LARGE, UNPREDICTABLE ROCK SLIDE ABOVE PROPOSED ROAD.

NOTE DEEP GASH TO RIGHT.



UNPREDICTABLE BOULDERS AND LANDSLIDE DIRECTLY ABOVE PROPOSED ROAD.

FREEZE AND THAW CYCLES WILL DISLODGE MEGA BOULDERS.

Mt. Phoebe and Peak 5984 with Kensington Mine along beach to the right. Lynn Canal east side.



12-30' TALUS

DEBRIS FLOWS

WAVE CUT TERRACE

AVALANCHE 05

ROCKFALL

Mega Talus

10-15' TALUS OVER BEDROCK

10' TALUS

EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782
SCALE	AS SHOWN
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DATE	12/21/06
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DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 1615+00 - 1697+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 3

STEEP, CLIFFY
TERRAIN

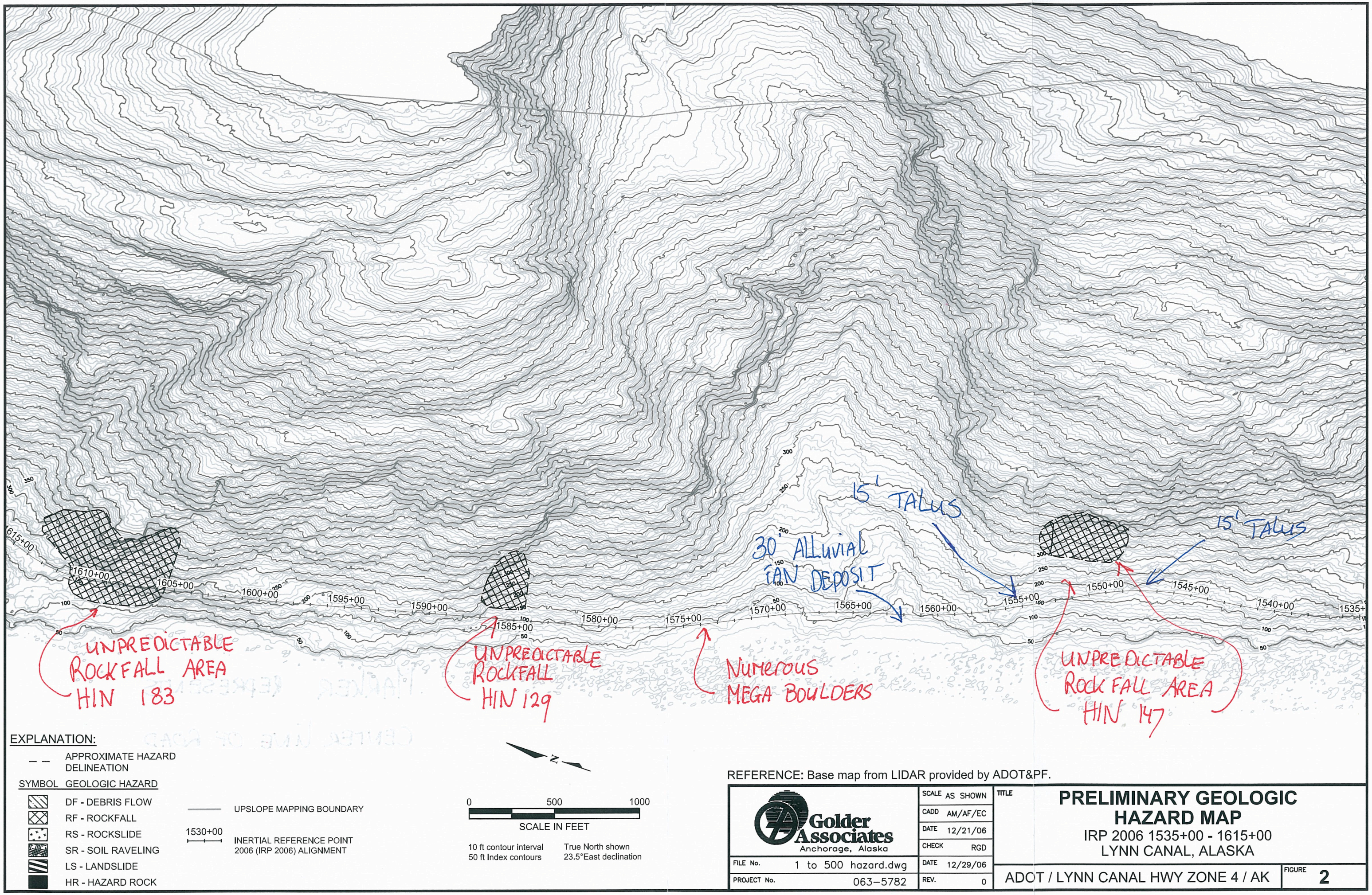


RUGGED TERRAIN ALONG PROPOSED ROAD.

ISOSTATIC REBOUND AT A RATE OF

.95 INCHES A YEAR WILL MAKE ROAD BUILDING AND MAINTENANCE A NIGHTMARE





EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
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	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

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Anchorage, Alaska

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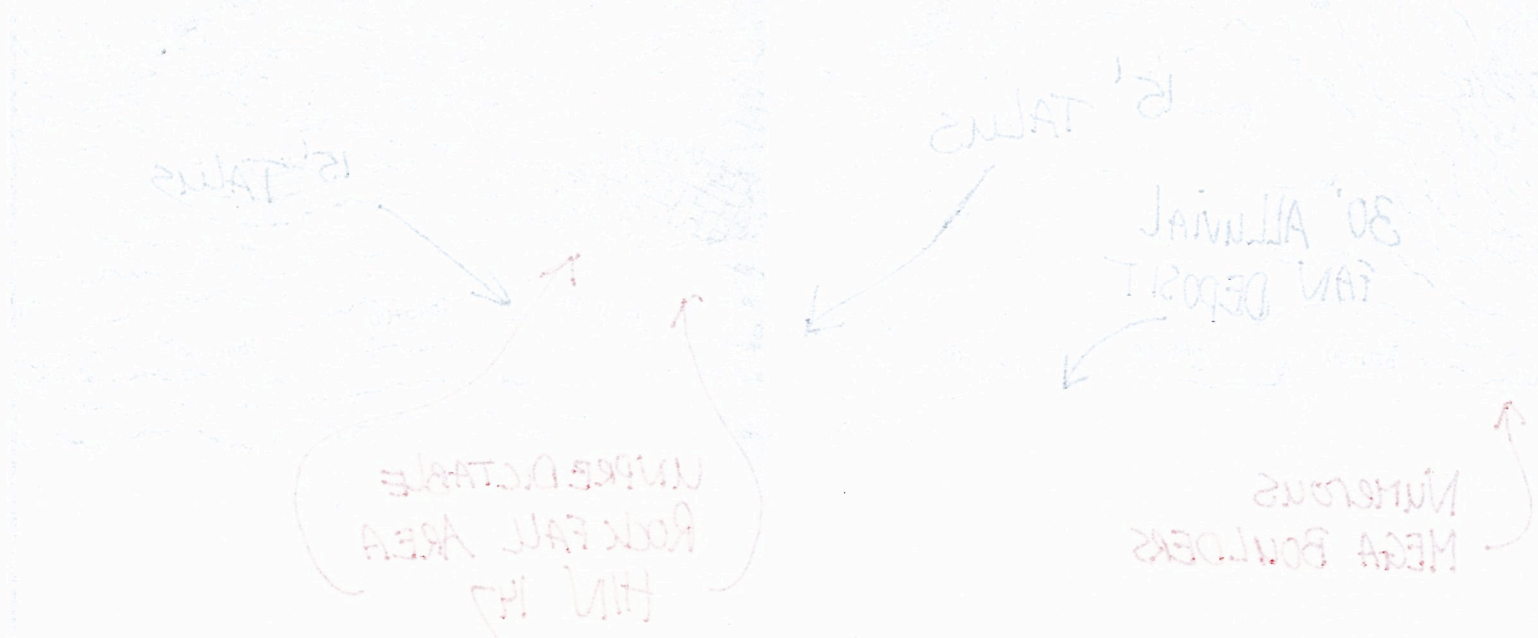
TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 1535+00 - 1615+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 2

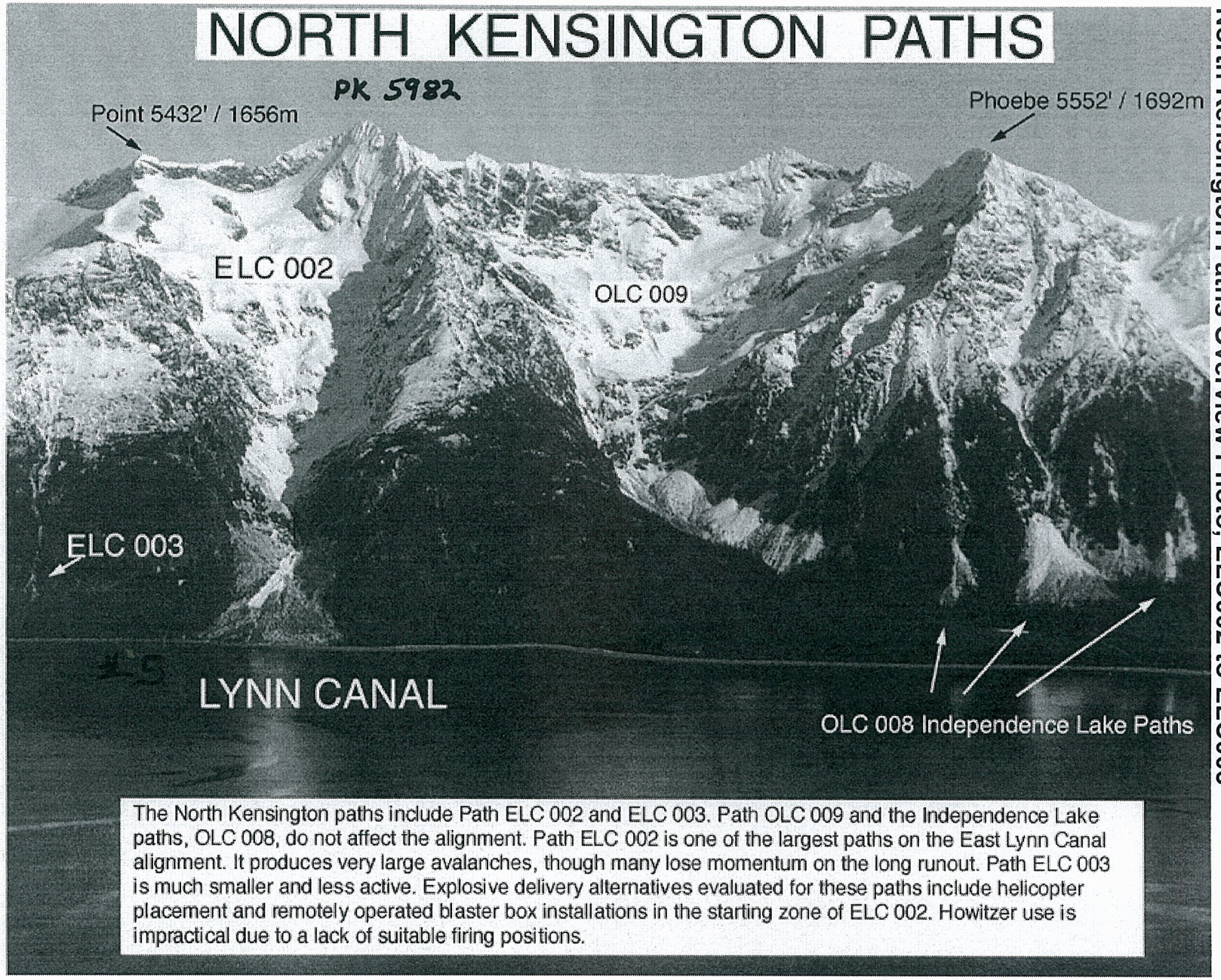


MARKER REPRESENTS
CENTER LINE OF ROAD



Typical AVALANCHE AND DEBRIS FLOW





The North Kensington paths include Path ELC 002 and ELC 003. Path OLC 009 and the Independence Lake paths, OLC 008, do not affect the alignment. Path ELC 002 is one of the largest paths on the East Lynn Canal alignment. It produces very large avalanches, though many lose momentum on the long runout. Path ELC 003 is much smaller and less active. Explosive delivery alternatives evaluated for these paths include helicopter placement and remotely operated blaster box installations in the starting zone of ELC 002. Howitzer use is impractical due to a lack of suitable firing positions.

North Kensington Paths Overview Photo, ELC002 to ELC003

15' TALUS

25' TALUS

UNPREDICTABLE ROCK FALL

DEBRIS FLOW

AVALANCHE 011 17th HIGHEST

AVALANCHE 010 16th HIGHEST

AVALANCHE 09

*HIN 279

SEGMENT 1727 TO 1740:

GNEISS AND METASEDIMENTARY CLIFFS STEEP TO OVERHANGING RISE FROM TIDE WATER TO GREATER THAN 500 FT. TALUS AND DEBRIS FLOWS WILL THREATEN ANY CUT. THIS SEGMENT NEEDS FURTHER EVALUATION FOR POSSIBLE TUNNEL OR ELEVATED HIGHWAY.

MEGA TALUS

AVALANCHE 07

AVALANCHE 06 2ND HIGHEST

DEBRIS FLOWS

EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782

SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 1695+00 - 1775+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 4

HAZARDOUS ROCK FALL AND DEBRIS FLOW RIGHT ABOVE PROPOSED ROAD

NOTE NUMEROUS DEBRIS FLOWS TO THE LEFT OF CLIFF.



LARGE, UNPREDICTABLE ROCK FALL HAZARD



FROZEN WATERFALLS OVER PROPOSED ROAD.

NOTE LARGE BOULDERS AT BEACH



CLIFF WITH DEBRIS FLOW WITH
LARGE ACTIVE CREEK

ANOTHER VIEW OF CLIFFS WITH FROZEN WATERFALLS

ACTIVE TERRAIN.

ORANGE ROCK TYPICALLY MEANS LOOSE AND UNSTABLE. (UPPER CLIFF).

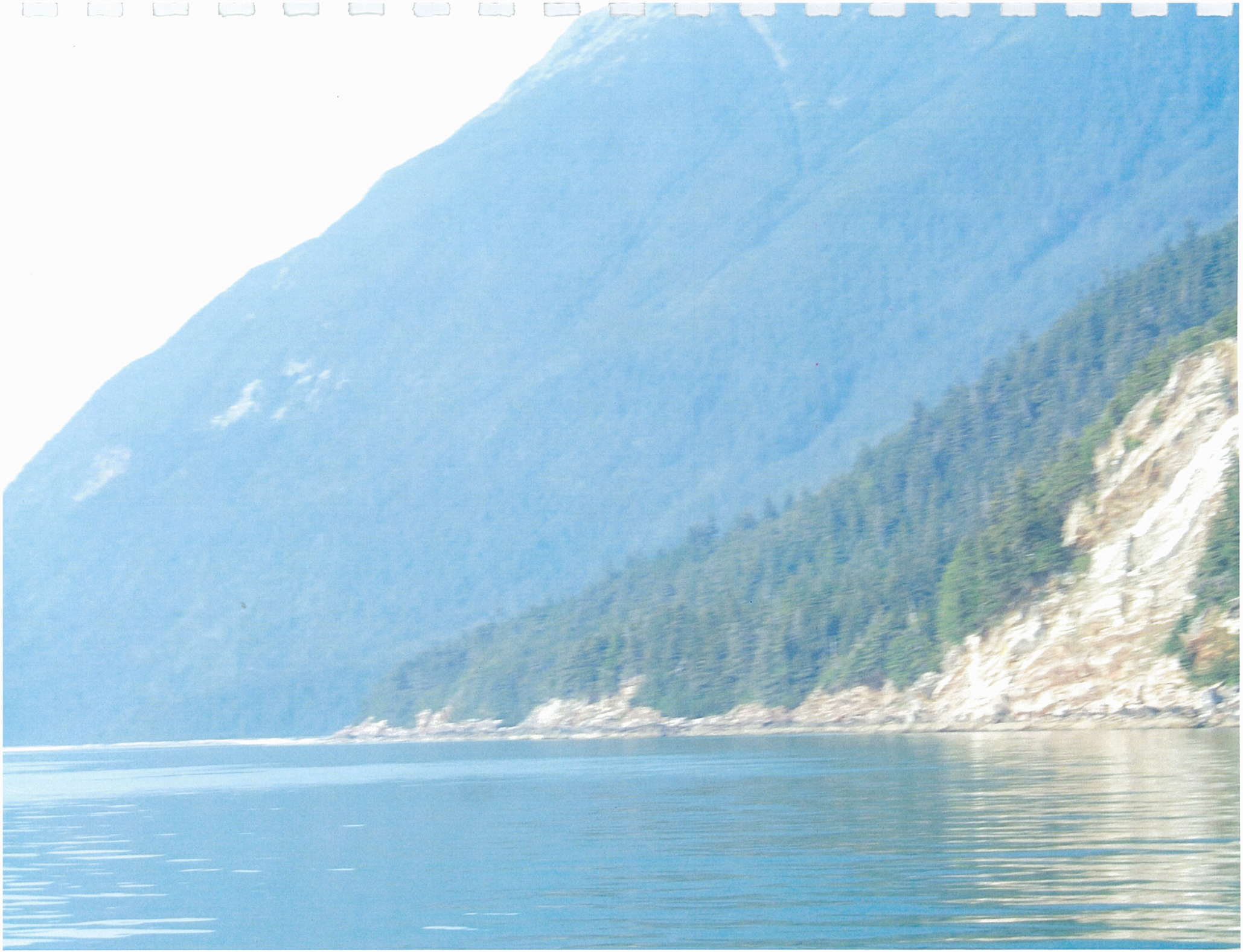


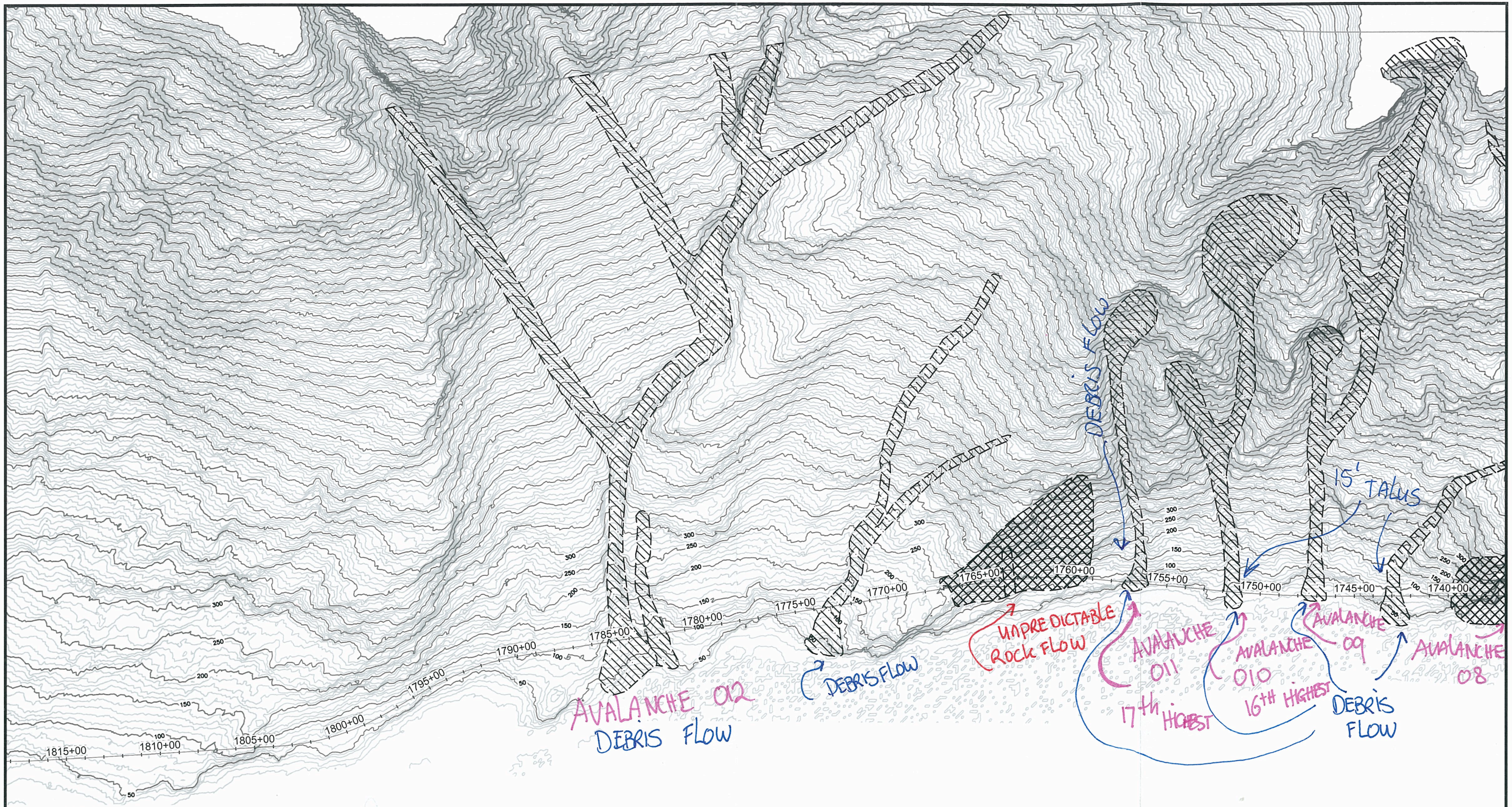
UNPREDICTABLE ROCKY CLIFF ABOVE

PROPOSED ROAD



LOOKING NORTH ALONG PROPOSED ROAD





EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

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DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

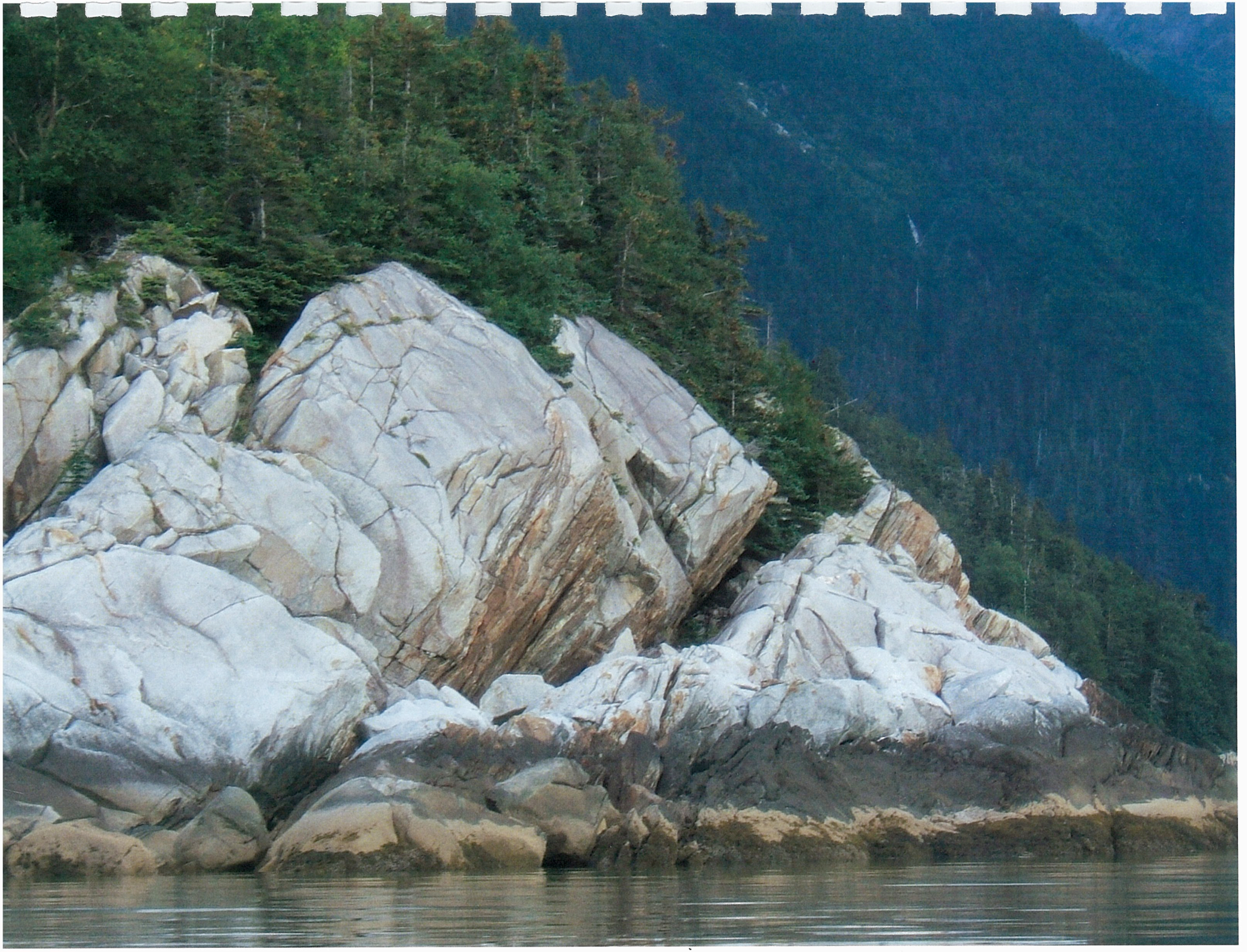
IRP 2006 1737+00 - 1818+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 5



RUGGED SHORE LINE



Typical DEBRIS FLOW, ONTO ROAD.

NOTE CUT TREES AND FLAGGING TO RIGHT.



Typical AVALANCHE AND DEBRIS FLOW

DOWN TO TIDELINE



20' GLACIAL OUTWASH DEPOSIT

15' LAND-SLIDE DEPOSIT

ROCKFALL

DEBRIS FLOW CHANNEL

15' DEBRIS FLOW DEPOSIT

SEGMENT 1855 to 1885:

THE PROPOSED ALIGNMENT CROSSES A MAJOR CREEK AND TRAVERSES ALONG THE BASE OF THE GLACIAL OUTWASH SCARP, WHICH IS CUT BY NUMEROUS LANDSLIDE DEPOSITS

AVALANCHE 014
LOW PREDICTABILITY
10th HIGHEST

AVALANCHE 013
WITH MAJOR CREEK
VERY LARGE

DEBRIS FLOW

EXPLANATION:

- APPROXIMATE HAZARD DELINEATION

SYMBOL GEOLOGIC HAZARD

- DF - DEBRIS FLOW
- RF - ROCKFALL
- RS - ROCKSLIDE
- SR - SOIL RAVELING
- LS - LANDSLIDE
- HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

0 500 1000
SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

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PROJECT No.	063-5782
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DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 1812+00 - 1900+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 6



VIEW LOOKING NORTH
FROM PEAK 5924.
KATZEHIN RIVER DELTA
UPPER RIGHT

Climber high on steep avalanche slopes. Peak 5924.

CLIMBERS HAVE WITNESSED SEA LION HAUL OUTS IN RANDOM AREAS UP AND DOWN THE EAST SIDE OF Lynn CANAL

DEBRIS FLOW WITH LARGE LOGS

DUMPED ON BEACH



AVALANCHE CHUTE DOWN TO TIDE WATER

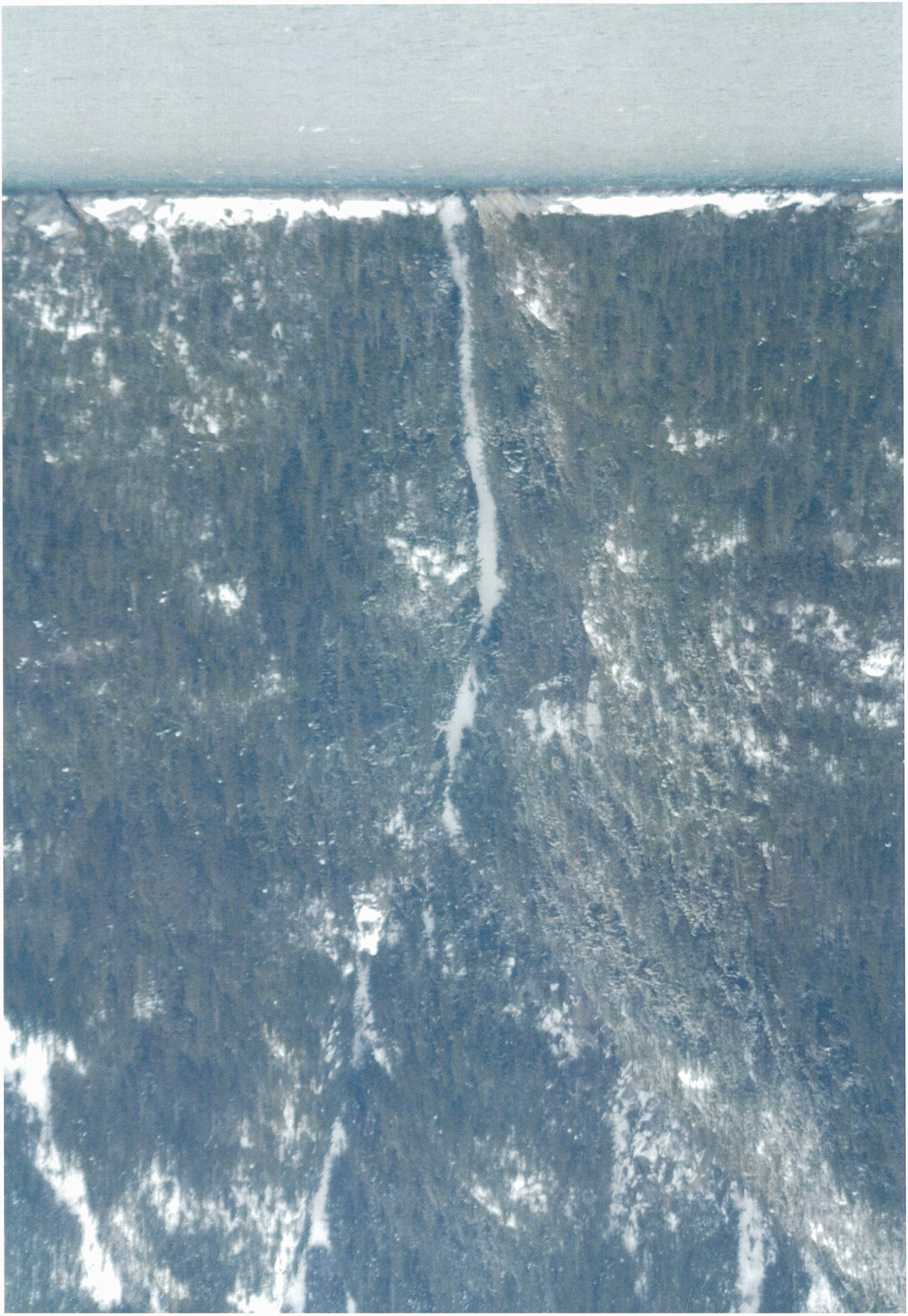
SUMMER VIEW OF DEBRIS FLOW WITH SNOW AND ROCK DOWN TO SHORE LINE.

ONE OF MANY DEEP GASHES IN SOLID ROCK

PRESENTING OBSTACLES



WINTER SHOT OF DEEP AND STEEP GASH IN CLIFF



Typical AVALANCHE PATH ABOVE PROPOSED ROAD



AN ESTIMATED 600 GOATS LIVE ON THE EAST SIDE OF LYNN CANAL, WITH MANY LIVING IN THE PATH OF PROPOSED ROAD.



ACTIVE AVALANCHE PATH AND DEBRIS FLOW ABOVE PROPOSED ROAD.



Classic DEBRIS FLOW WITH BOULDERS ON BEACH.

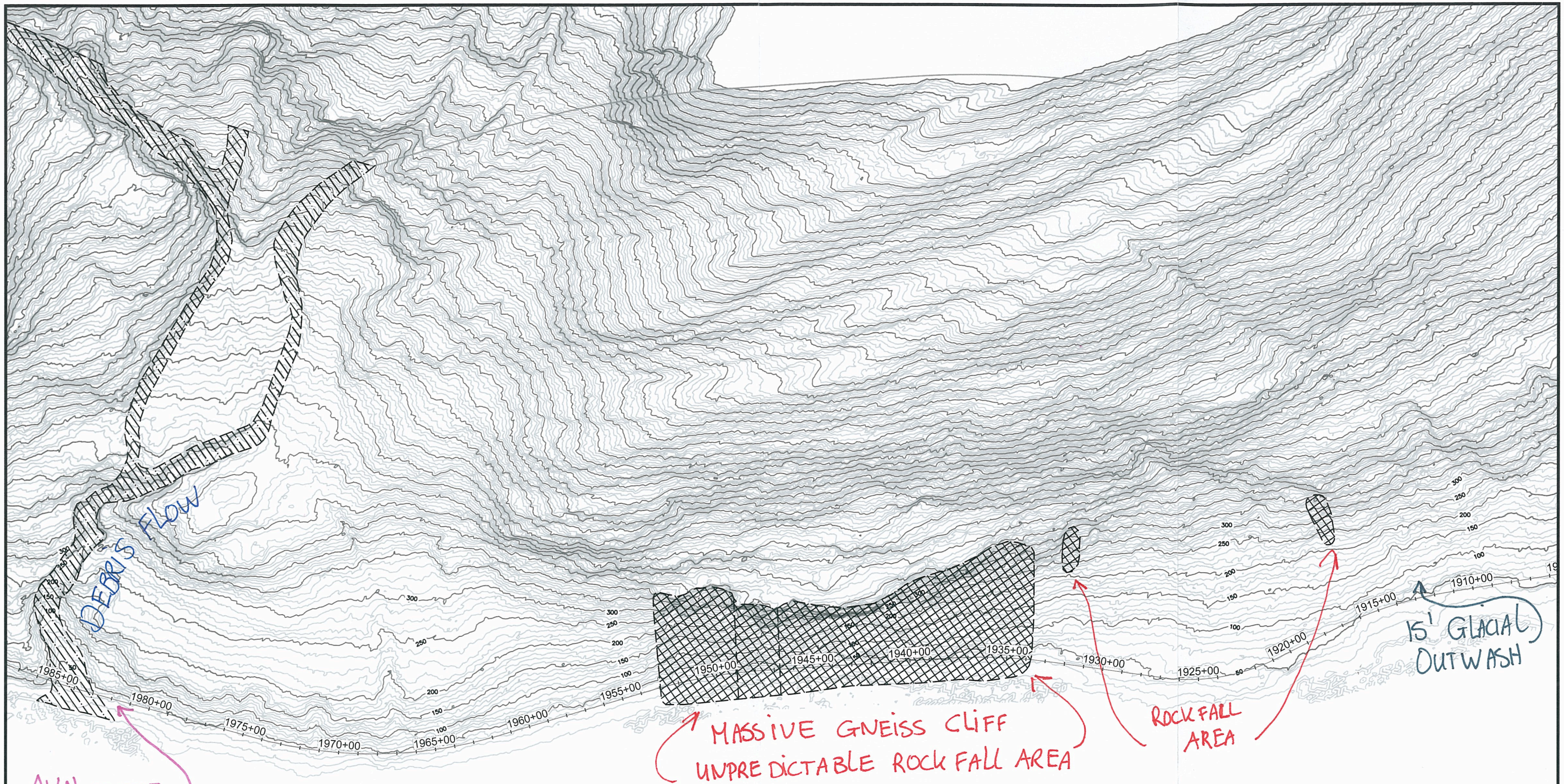
RIBBONS AND CENTERLINE MARKERS HAVE BEEN OBSERVED.



IN SOME AREAS, ROAD IS SUBJECT TO WAVE ATTACK.

CLIMBER NAVIGATING STEEP, GRANITE CLIFFS.





EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
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	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

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REV.	0

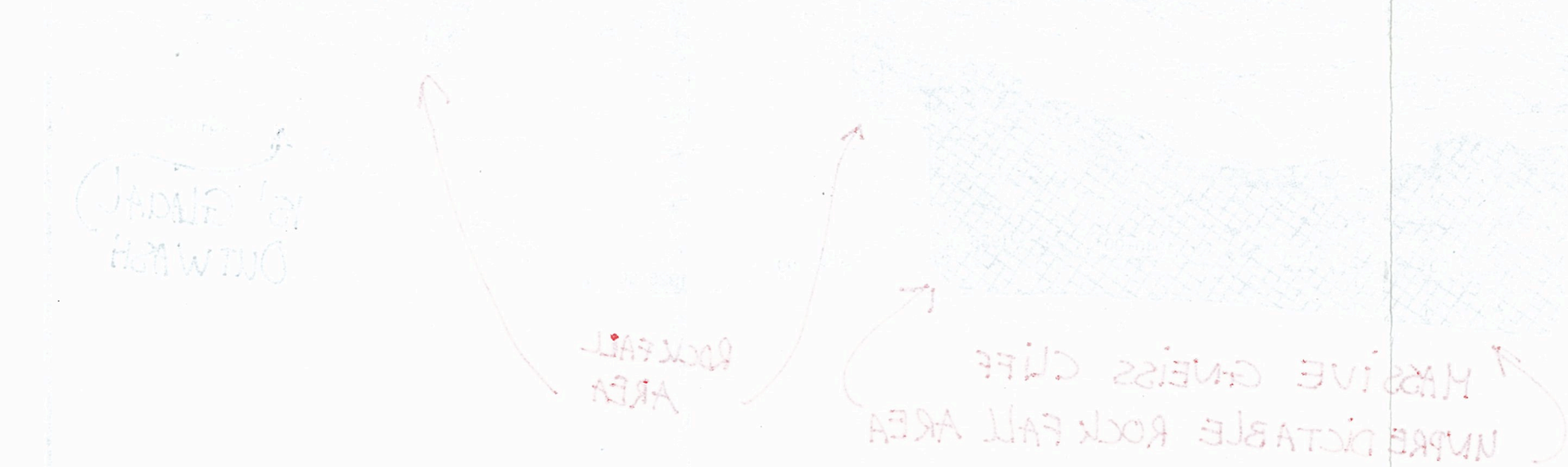
TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 1906+00 - 1987+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 7



View of Mt Selby
Elev. 6330
Summit is less than
2mi from proposed road.



Climbers standing on
Mt. Selby (Elev. 6330)



AVALANCHE PATH OFF MT. SELBY
DOWN TO BEACH.



Climbers on steep avalanche slopes. Mt. Selby.



POWERFUL AVALANCHE BLAST HAS KNOCKED DOWN THOUSANDS OF TREES ABOVE PROPOSED ROAD

VERY STEEP AND DANGEROUS AVALANCHE SLOPE. 2000 FT ABOVE PROPOSED ROAD.

THICK AVALANCHE DOWN TO
TIDE LINE

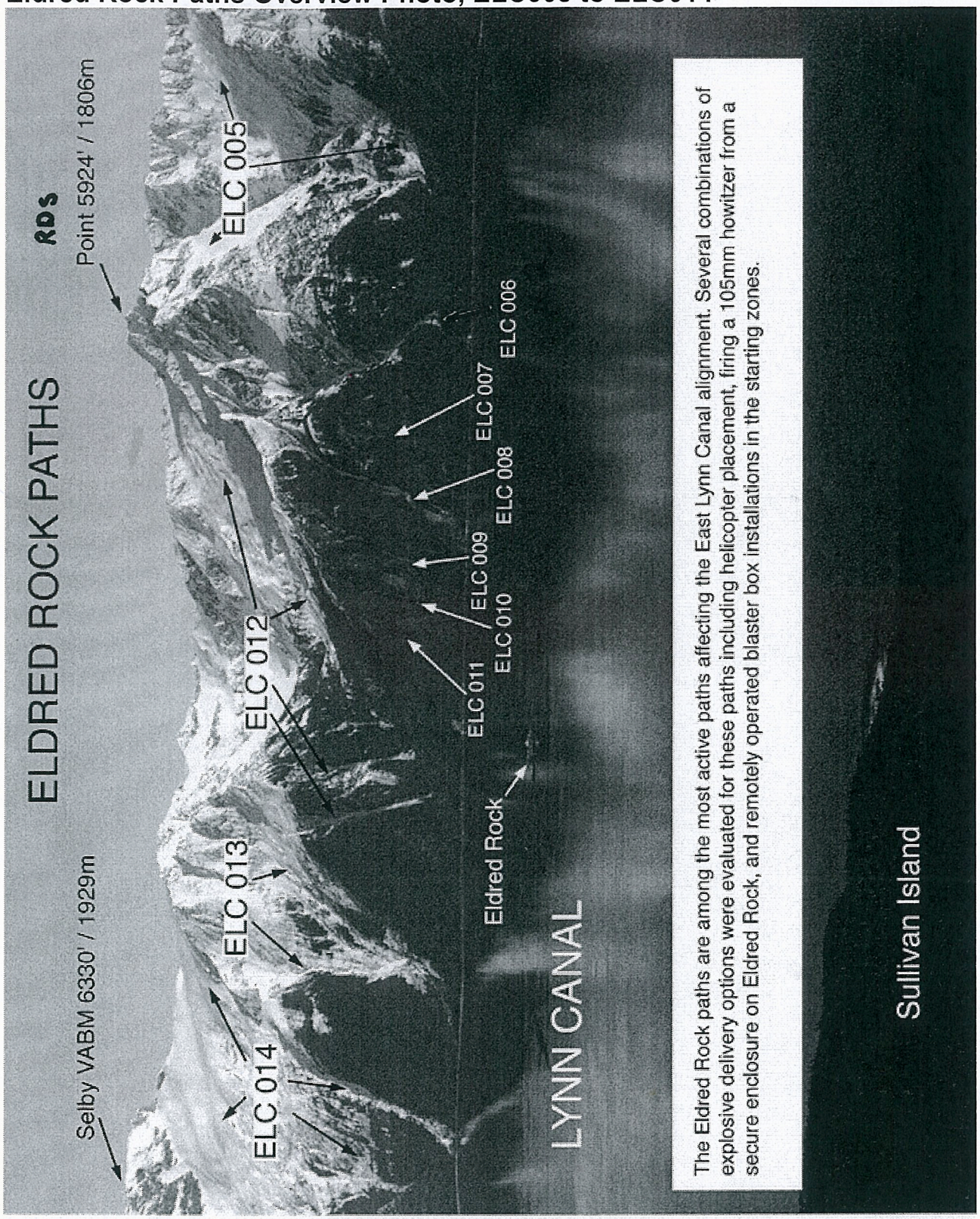
MT. SELBY AVALANCHE AREA
AND DEBRIS FLOWS

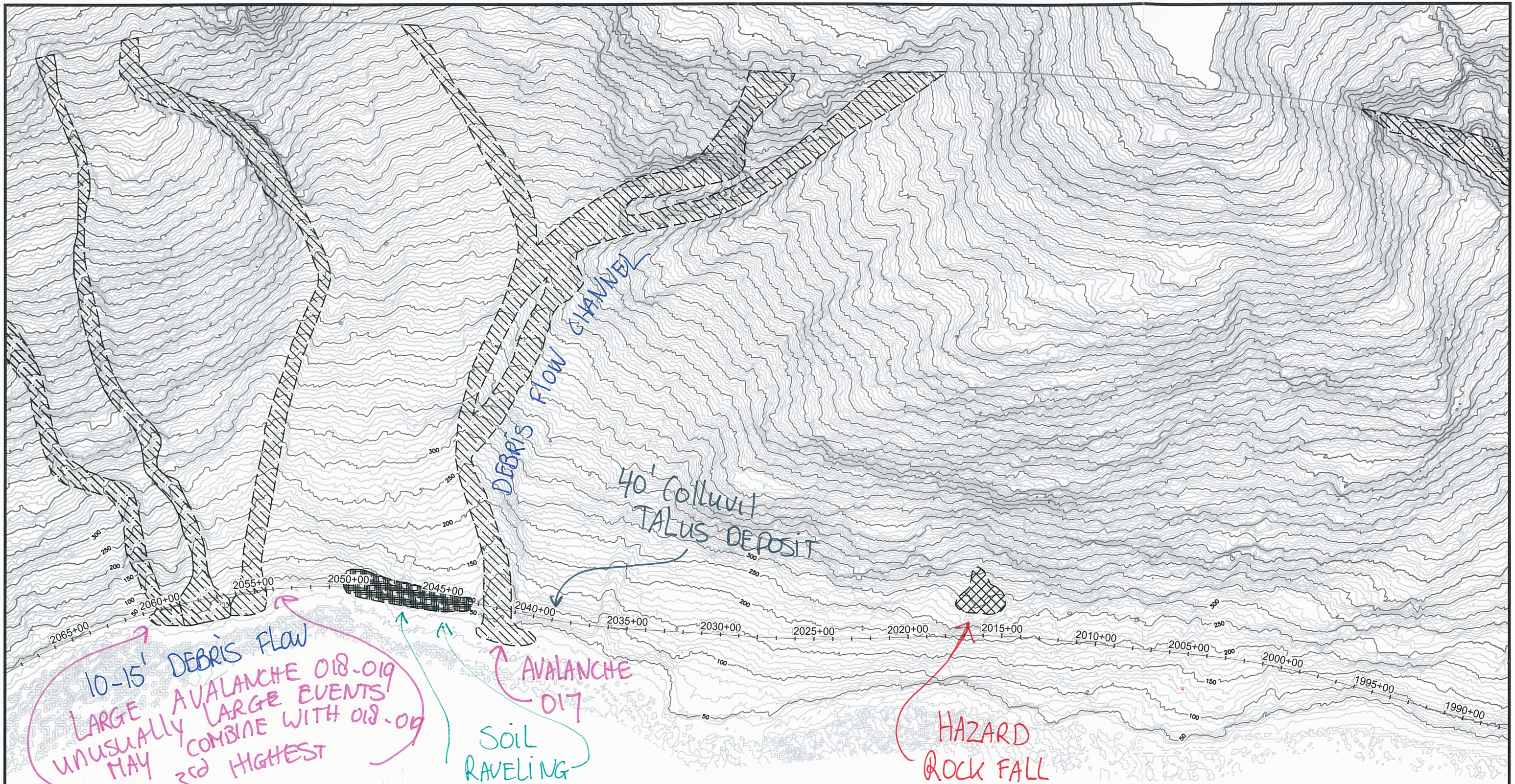
CLIMBER TRAVERSES STEEP CLIFFS

ANOTHER AVALANCHE FLOW.
ONE OF 31 AVALANCHE PATHS
IMPACTING PROPOSED ROAD.

E.R

Eldred Rock Paths Overview Photo, ELC005 to ELC014





EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
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	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

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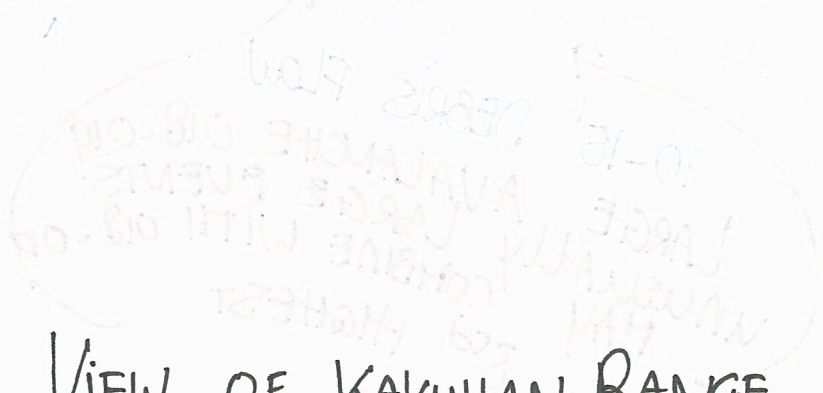
TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

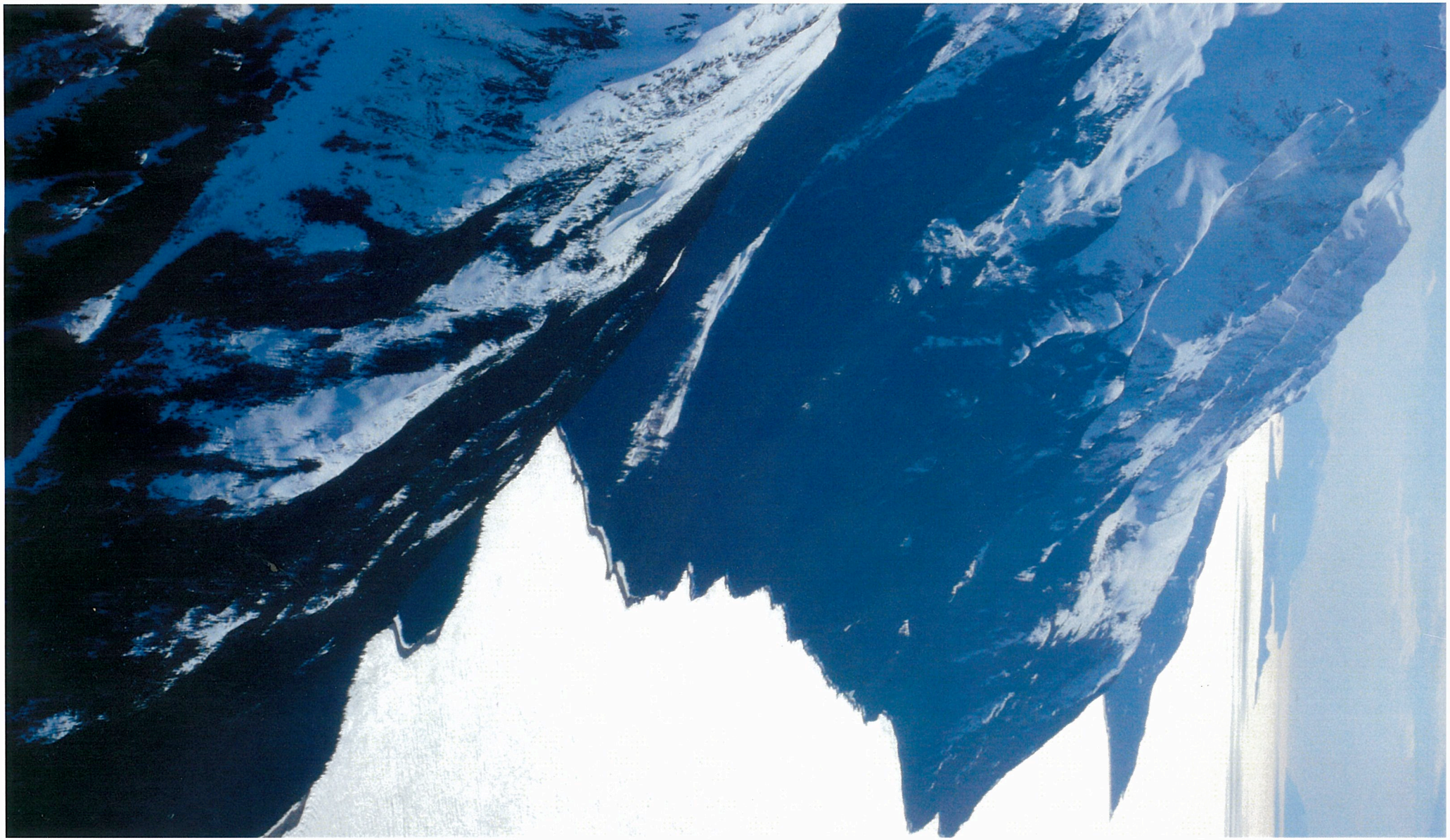
IRP 2006 1988+00 - 2068+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 8



VIEW OF KAKUHAN RANGE
LOOKING SOUTH, DOWN
THE CONVOLUTED SHORELINE.



DESTRUCTION BY
AVALANCHES WITH
HUGE DEBRIS PILE.

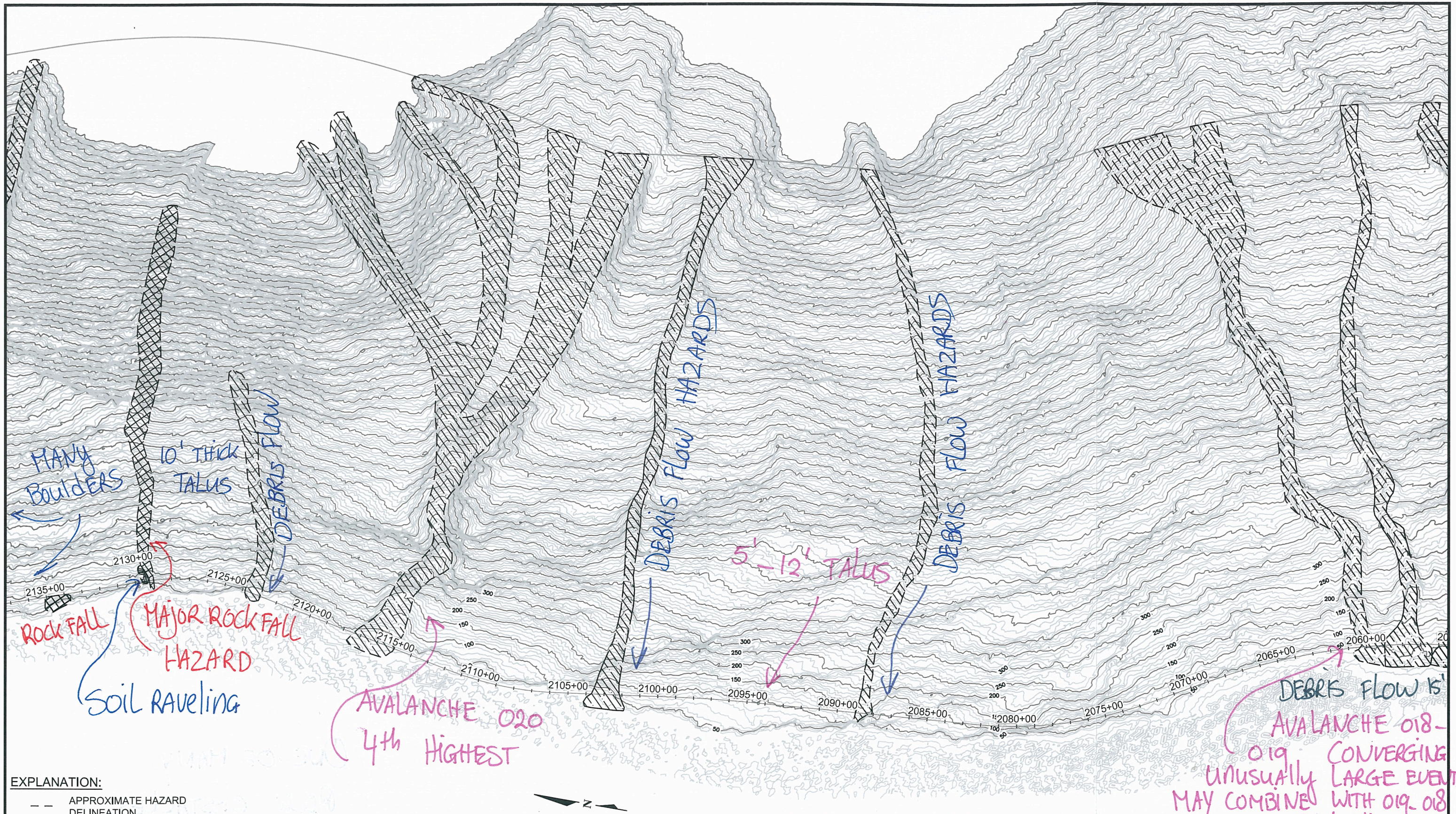


SEA LIONS IN
NATURAL HABITAT



VIEW LOOKING SOUTH, DOWN RUGGED SHORE LINE.





EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782
SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2056+00 - 2137+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 9



ONE OF MANY
ROCK OBSTACLES

Climber traversing
near vertical cliffs
along proposed road



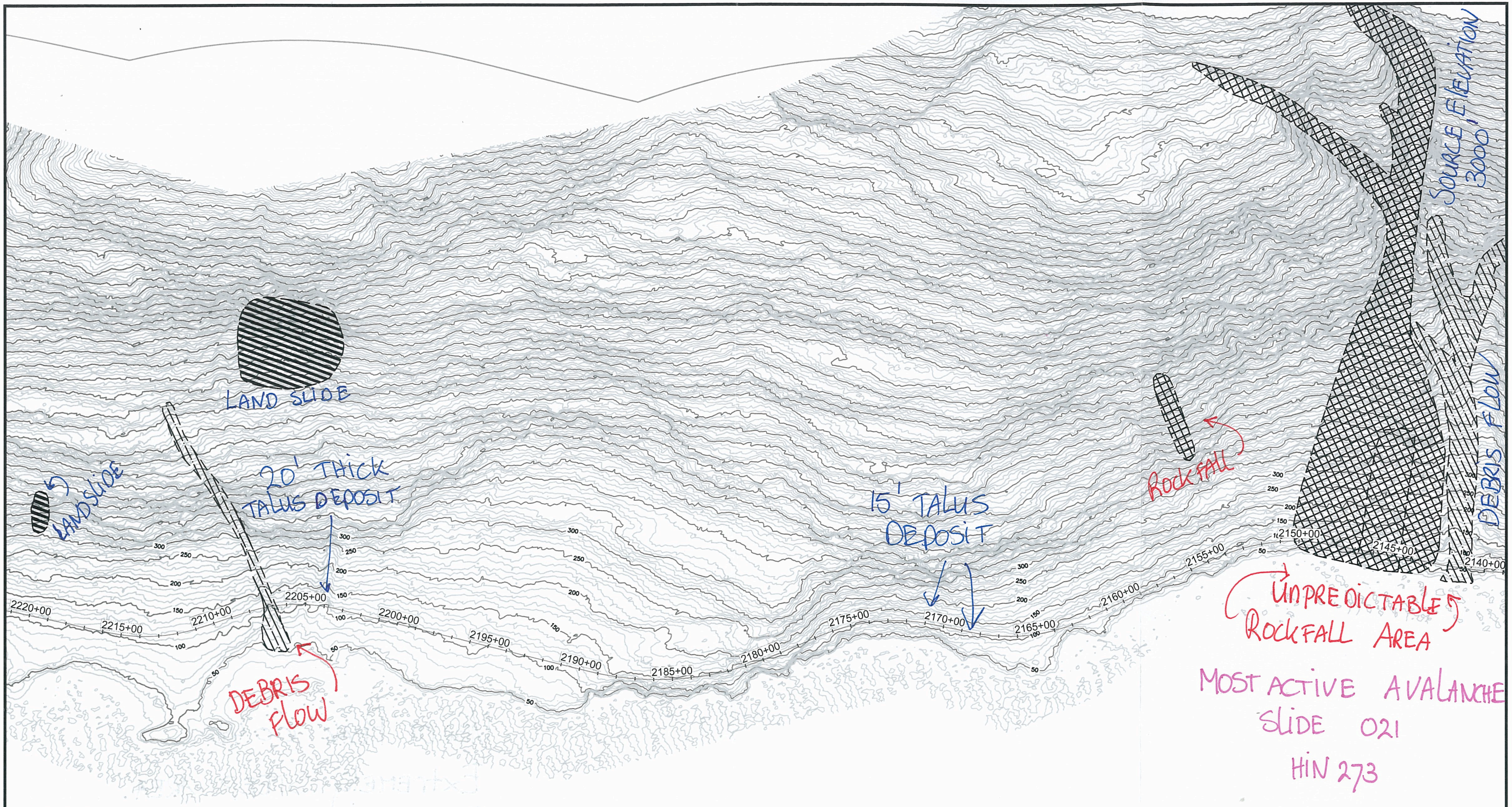
VIEW OF CENTER LINE MARKER



MEGA BOULDERS PURGED
ON MOUNTAIN SIDE







EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782
SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2139+00-2221+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

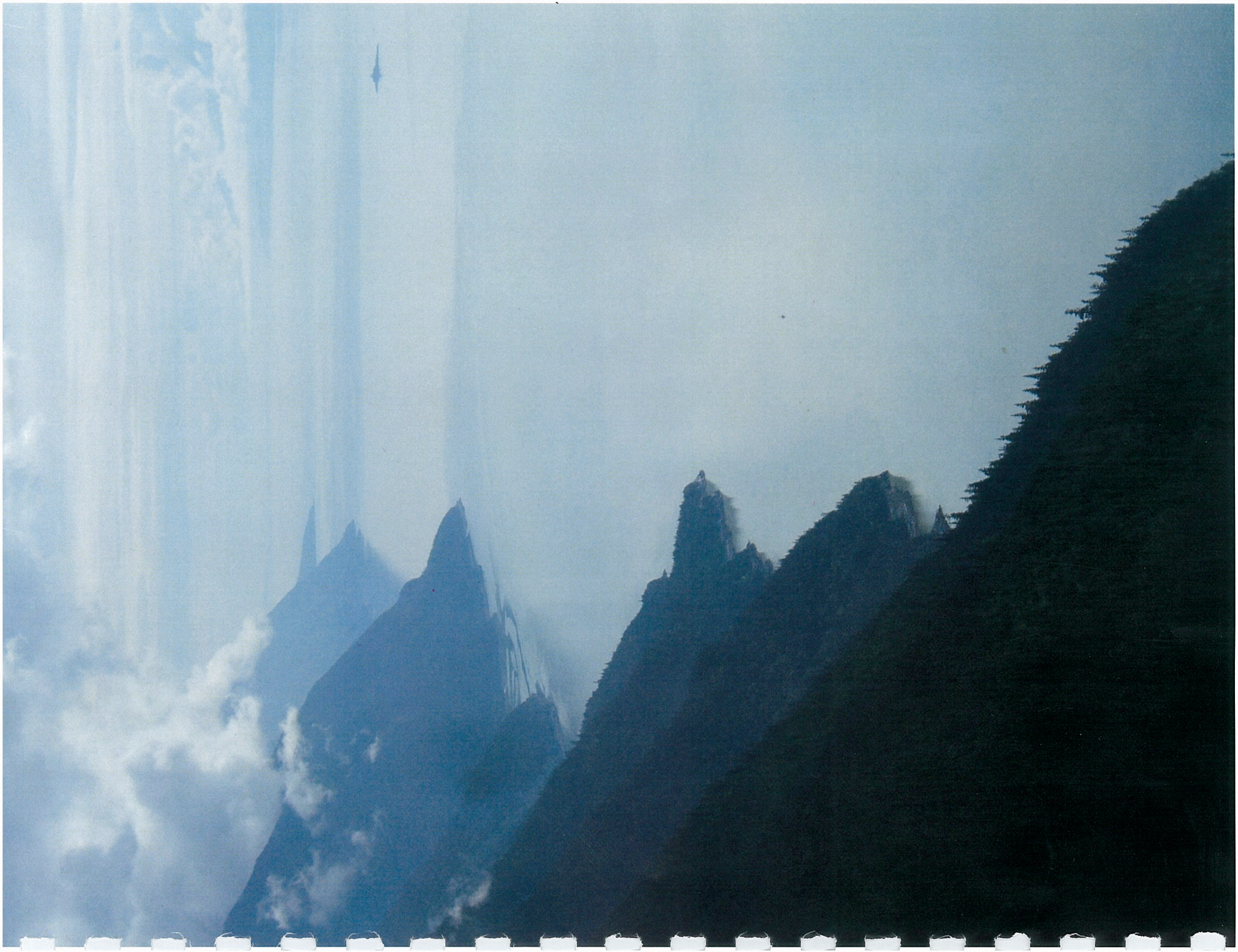
FIGURE 10

VIEW OF PEAK 6045.
EXTREMELY STEEP AREA.
POSES NUMEROUS HAZARDS FOR
PROPOSED ROAD, INCLUDING THE
LARGEST AVALANCHE PATH AND
GIANT ROCKSLIDE.

PEAK 6045. GIANT ROCK SLIDE. VERY UNPREDICTABLE AND EXTREMELY HAZARDOUS. HIN 273. Source elevation 3000+



IN-TACT LYNN CANAL.
AN OBVIOUS MARINE HIGHWAY

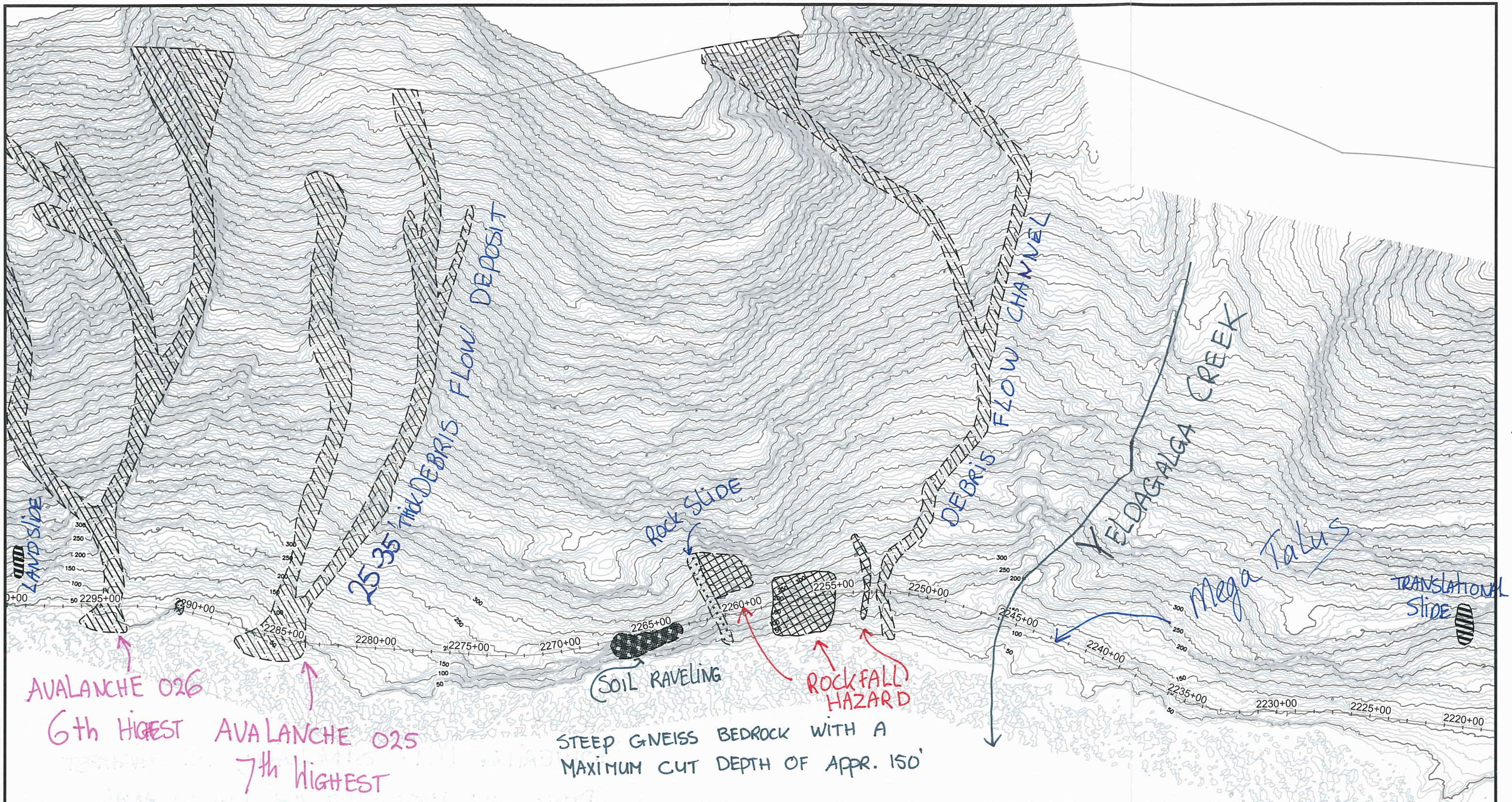


CLIMBER CROSSING AVALANCHE DEBRIS



—— Extremely and constantly moving, unstable terrain, all along the east side of Lynn Canal.
Note mega boulder upper left__





EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT
2006 (IRP 2006) ALIGNMENT

N

0 500 1000
SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782
SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2219+00-2300+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 11

TOWERING MT. SINCLAIR, THE HIGHEST PEAK ON EAST SIDE OF Lynn CANAL, WITH Yeldagalga CREEK FLOWING at BASE.

STEPHAN RICHIE AND
MICHAEL MILLER ARRIVING
AT YELDAGALGA CREEK ON
THEIR TRACK FROM BERNER'S BAY
TO HAINES



CLIMBER DESCENDING STEEP GULLY. PEAK 5894.



CLIMBER ON PEAK 6012.
MT SINCLAIR AREA

VIEW OF EAST SIDE.
PEAK 6045 AND THE PICKETS.
ROCKY AND STEEP SECTION.

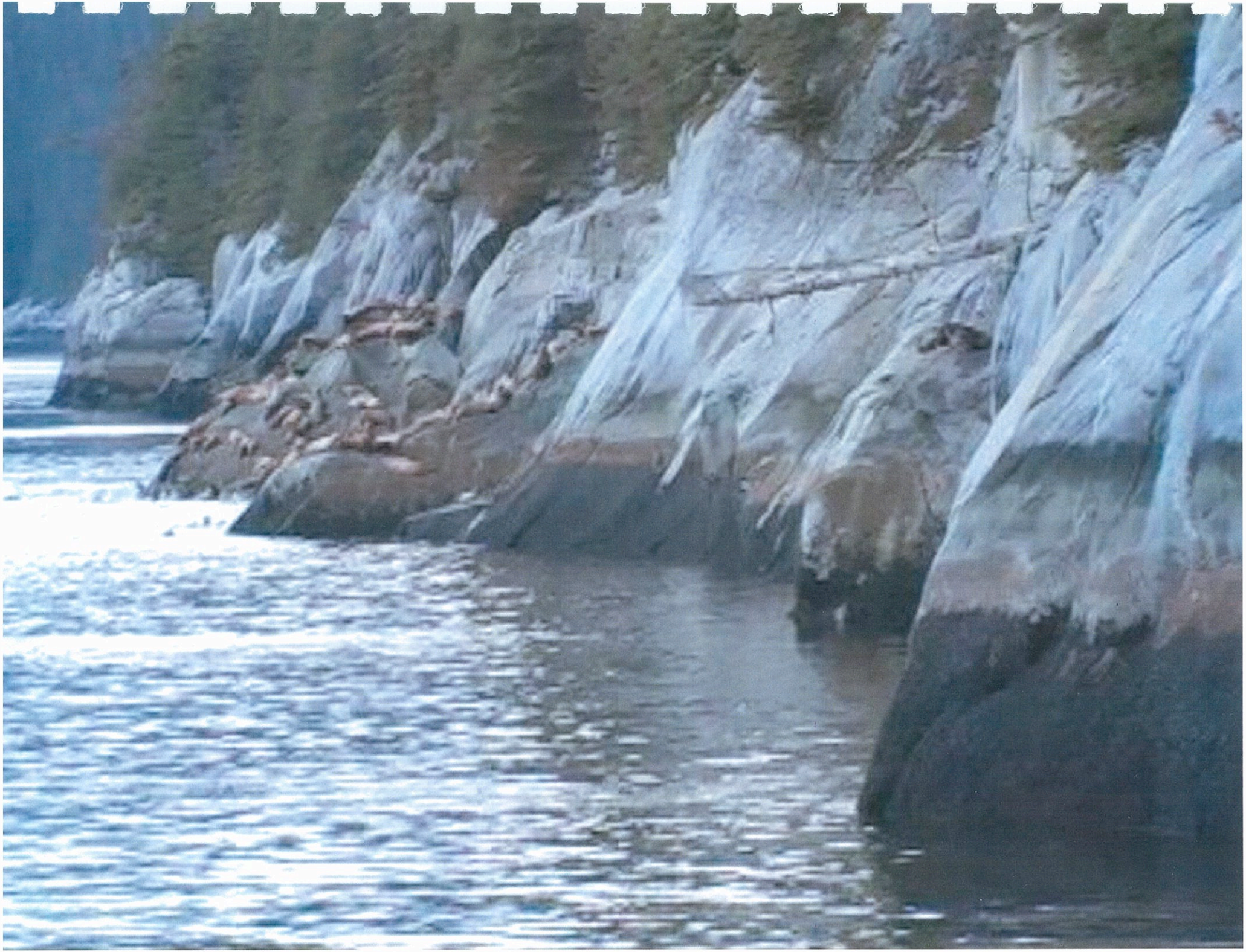


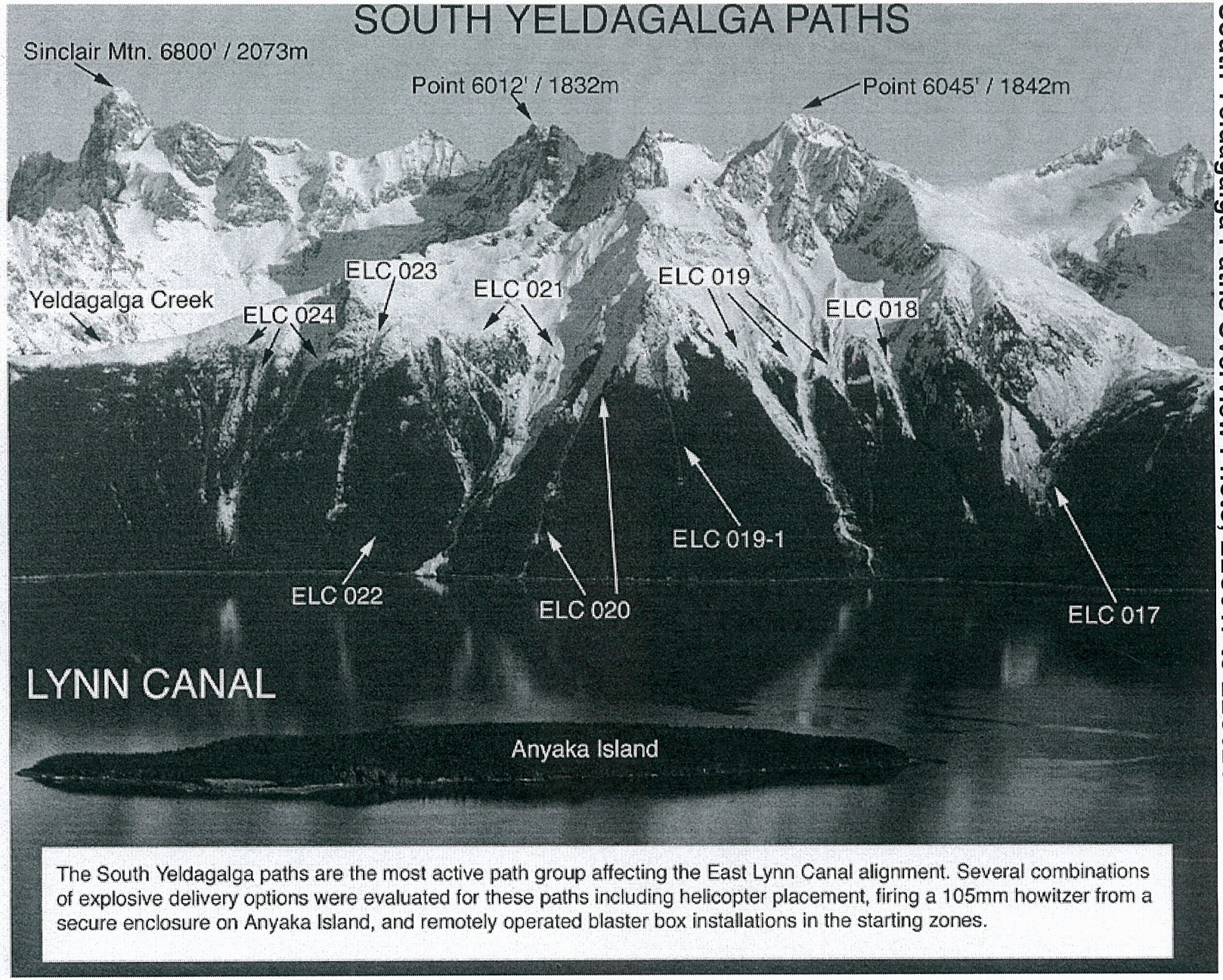
Climbers approaching

Peak 6012 ft.

Typical rugged and rocky
base of mountains at shoreline.







South Yeldagalga Paths Overview Photo, ELC017 to ELC024

SY

50' THICK GLACIAL OUTWASH DEPOSIT

SOIL RAVELING RELEASING ROCKS

MEGA TALUS 20' THICK

TRANSLATIONAL SLIDE

SEGMENT 2440 - 2415 NUMEROUS LANDSLIDE DEPOSITS

TRANSLATIONAL SLIDE

10' TALUS

HAZARD ROCKFALL

DEBRIS FLOW CHANNEL WITH ACTIVE STREAM

SEGMENT 2388 - 2391

THE PROPOSED ALIGNMENT TRAVERSES THE BASE OF GNEISS BEDROCK CLIFFS APPR. 300' HIGH FROM TIDEWATER. A cut would PROBABLY NEED TO BE AT LEAST 120' HIGH. EXFOLIATED GNEISS SLABS UPSLOPE OF THE CUT MAY PRODUCE ROCKFALL HAZARDS. ALIGNMENT SHOULD BE REVISITED.

A TUNNEL MAY BE WARRANTED IF A HIGHER ELEVATION ALIGNMENT IS NOT FEASIBLE.

OVERHANGING CLIFFS WITH FRESH ROCKFALL

UNPREDICTABLE HAZARD ROCK

SEGMENT 2445 to 2571 TALUS IN SOME LOCATIONS IS ESTIMATED TO BE 50' THICK

EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782

SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2379+00 - 2463+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 13



Climber traversing near vertical cliffs along proposed road.

LARGE, UNSTABLE CLIFFS
BEHIND PROPOSED ROAD

CHALLENGING ROAD BUILDING TERRAIN



STEEP AND TYPICAL
EAST SIDE OF Lynn CANAL
TERRAIN.



20' THICK MEGA TALUS

15-20' TALUS

DEBRIS FLOW

20-30' THICK MEGA TALUS DEPOSIT

DEBRIS FLOW

ROCK FALL AREA

2380+00 2375+00 2370+00 2365+00 2360+00 2355+00 2350+00 2345+00 2340+00 2335+00 2330+00 2325+00 2320+00 2315+00 2310+00 2305+00

UNPREDICTABLE HAZARD ROCKS

FRESH SCARRED CLIFFS BOULDERS AND ROCKFALL HAZARD AREAS HIN 255

SEGMENT 2360-2372

THE PROPOSED ALIGNMENT OPPOSITE GRAN POINT (SEA LION HAUL OUT) CROSSES ABOVE GNEISS GORGE THAT DESCENDS STEEPLY TO TIDEWATER. A BENCH CUT WOULD PROBABLY NEED TO BE AT LEAST 190 HIGH. EXFOLIATED GNEISS SLABS UPSLOPE OF THE CUT MAY PRODUCE ROCKFALL HAZARDS.

AVALANCHE 029 9th. HIGHEST

ROCKFALL HAZARD AREA

AVALANCHE 028

EXFOLIATED GNEISS SLABS UPSLOPE OF THE CUT MAY PRODUCE ROCKFALL HAZARDS

* POSSIBLE TUNNEL

EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
	SR - SOIL RAVELING
	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

0 500 1000
SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782
SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2301+00 - 2381+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 12

Climber HIGH ON
STEEP AVALANCHE CHUTE.

LARGE DEBRIS FLOW
IMPACTING ALIGNMENT.



AVALANCHE POURING OFF MOUNTAIN TOP, DIRECTLY ONTO ROAD.

AN AREAL VIEW OF THE EAST SIDE OF LYNN CANAL; FROM PEAK 6045, THE PICKETS, MT. SINCLAIR, AND PEAK 4401.

NOTE EXTREME AVALANCHE DANGER.



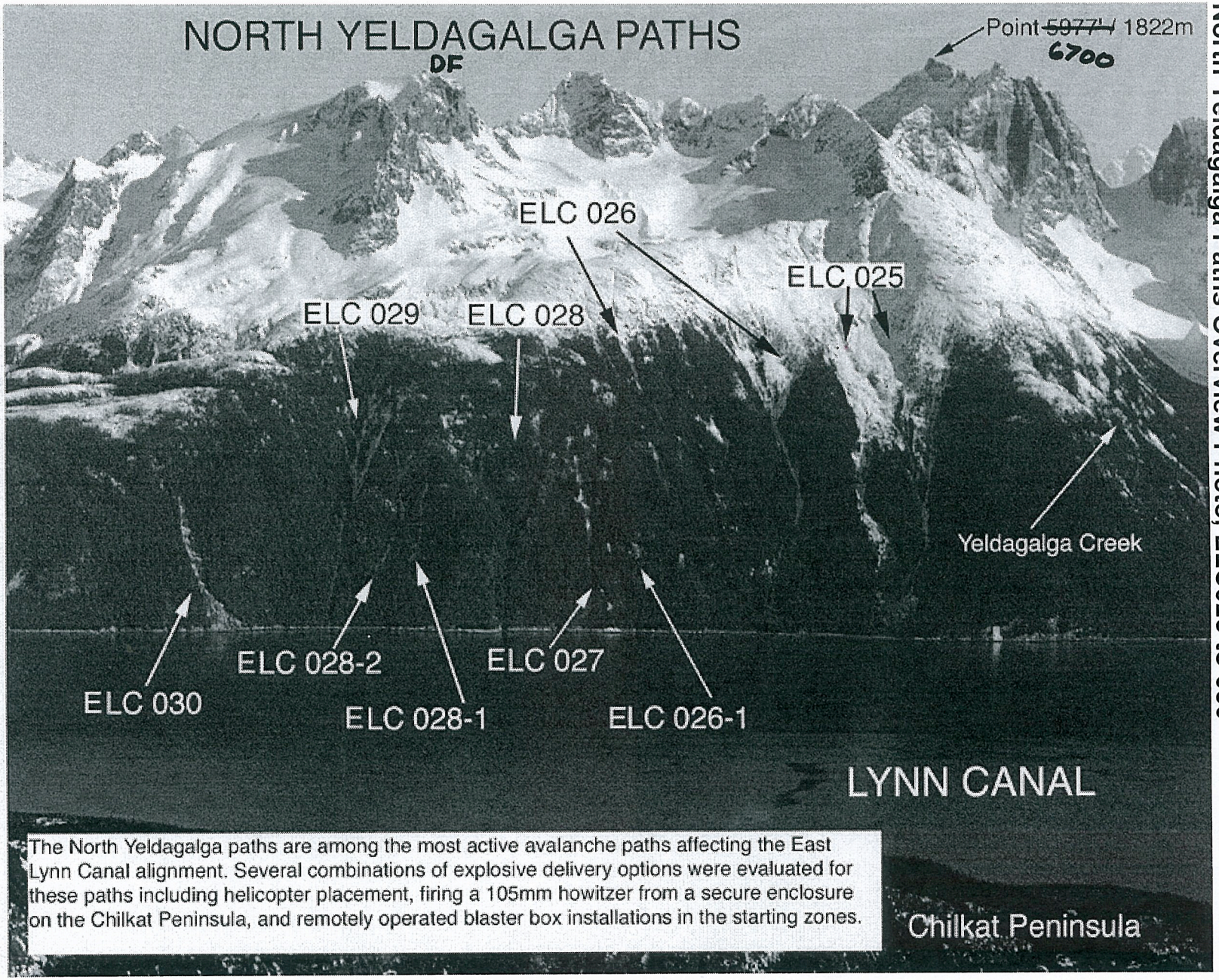
MEGA BOULDER EXCEEDING
165 ft in DIAMETER, FALLEN ON
CENTER LINE OF PROPOSED ROAD
(NOTE MARKER)



GRAN POINT SEA LION HAUL OUT.

CLIMBERS HAVE OBSERVED 400 + SEA LIONS. A ROAD would DESTROY THEIR PEACEFUL HABITAT.





The North Yeldagalga paths are among the most active avalanche paths affecting the East Lynn Canal alignment. Several combinations of explosive delivery options were evaluated for these paths including helicopter placement, firing a 105mm howitzer from a secure enclosure on the Chilkat Peninsula, and remotely operated blaster box installations in the starting zones.

North Yeldagalga Paths Overview Photo, ELC025 to 030

10'–20' THICK TALUS

2540+00 2535+00 2530+00 2525+00 2520+00 2515+00 2510+00 2505+00 2500+00 2495+00 2490+00 2485+00 2480+00 2475+00 2470+00 2465+00 2460+00

HAZARD ROCKFALL AREA AND BOULDERS UNPREDICTABLE

40-50' THICK MEGATALUS DEPOSIT UNPREDICTABLE LARGE HAZARD ROCK

HAZARD ROCKFALL AREA UNPREDICTABLE

DEBRIS FLOW CHANNEL

ROCKFALL HAZARDS

EXPLANATION:

– – APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
	RF - ROCKFALL
	RS - ROCKSLIDE
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	LS - LANDSLIDE
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UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000

SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063–5782

SCALE	AS SHOWN
CADD	AM/AF/EC
DATE	12/21/06
CHECK	RGD
DATE	12/29/06
REV.	0

TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2461+00 - 2543+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 14

PK 5900 –
CLIMBERS PEERING
OVER CLIFF

CLIMBER PASSING THROUGH
MASSIVE AVALANCHE DEBRIS



LOG JAM ON BEACH.

DEBRIS FLOW.

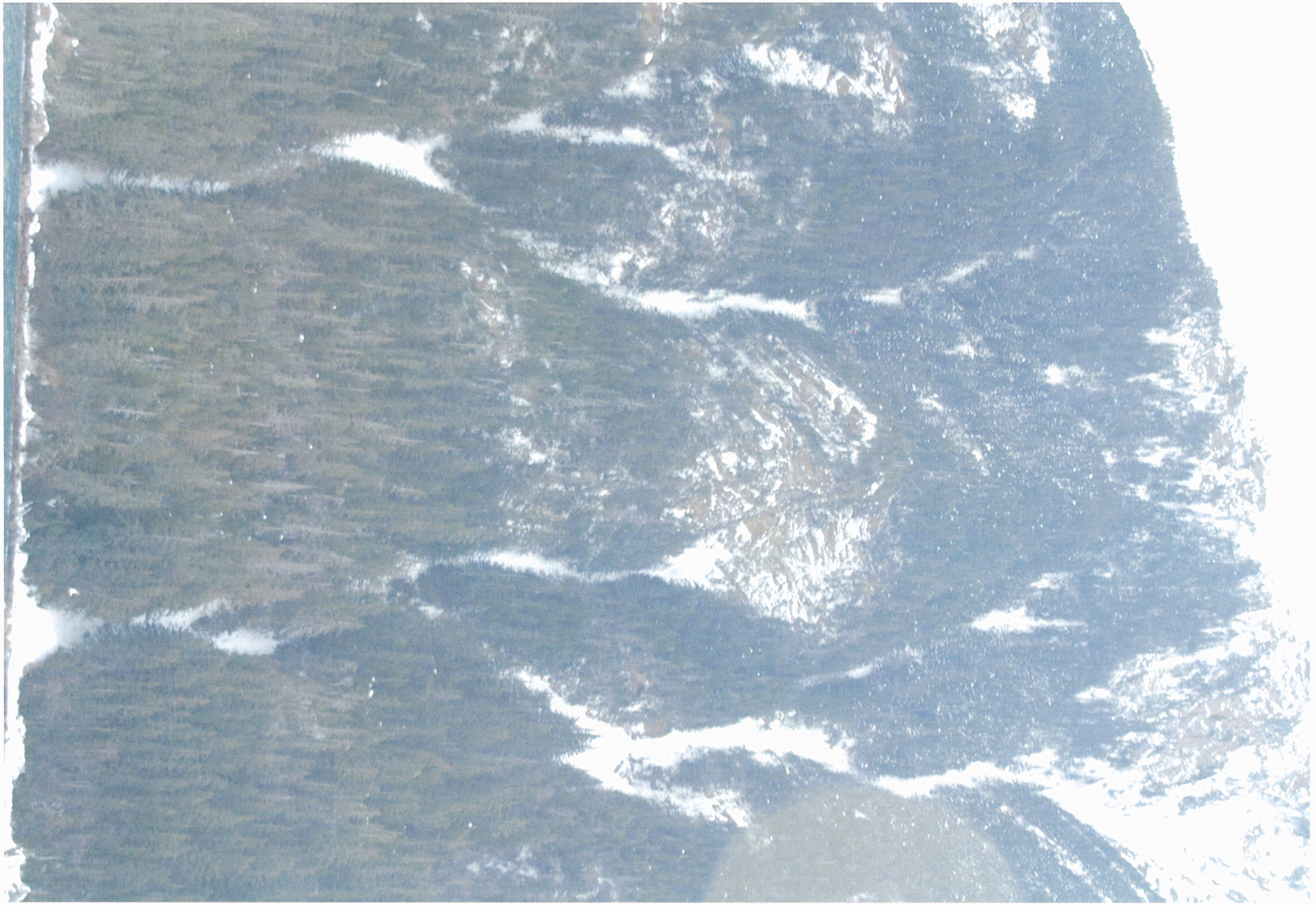


STEEP GULLY ON

CLIFF FACE

VERTICAL GULLY OFF PK 4401

TRICKY ROAD BUILDING!

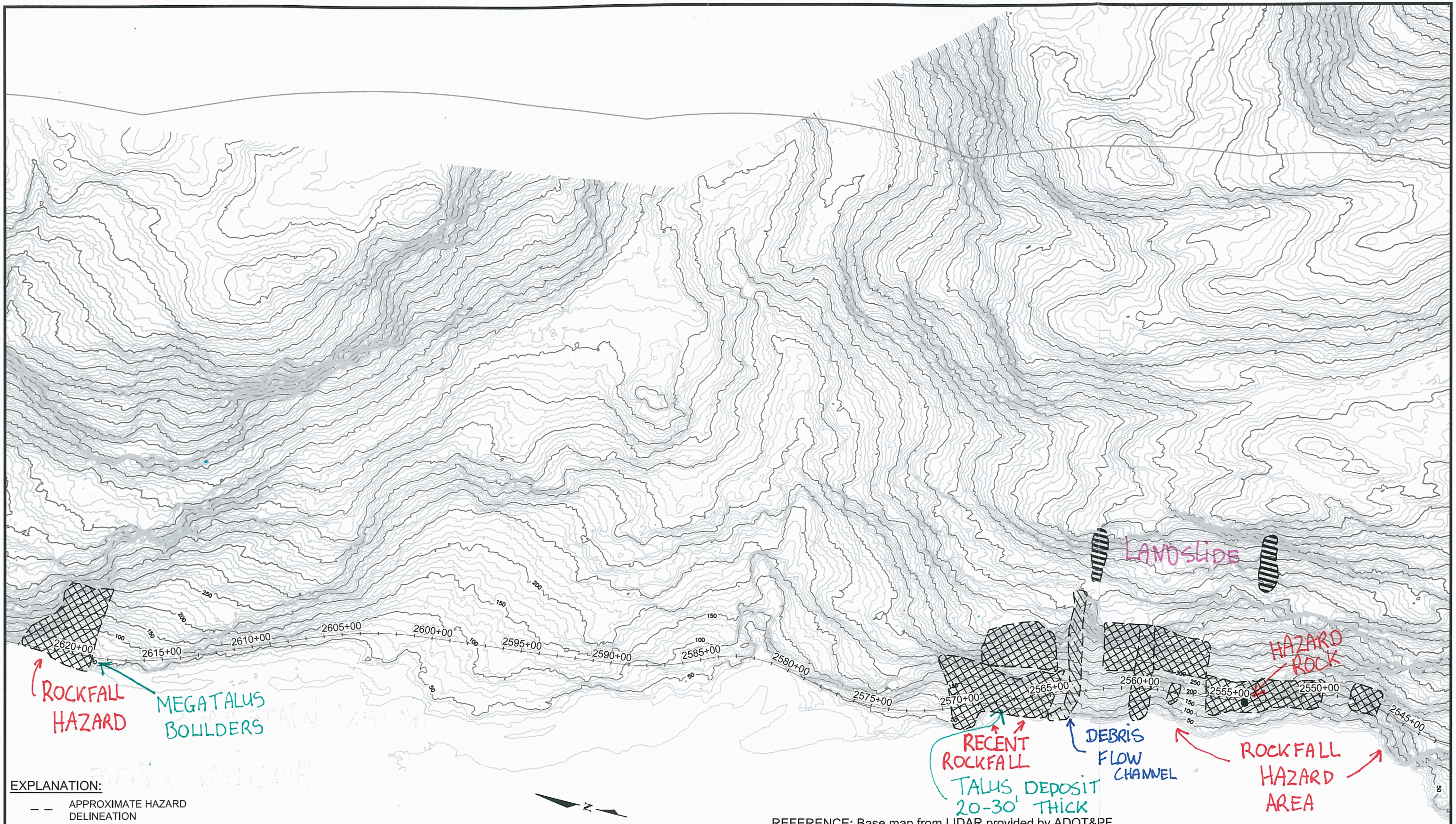


Climbing out of steep gully along proposed road; many loose boulders and talis tumbling down onto proposed road.

2546 100 24

CENTER LINE MARKER IN THE
Midst OF MOVING MOUNTAIN
Slope.


ASSISTANCE



EXPLANATION:

- APPROXIMATE HAZARD DELINEATION

SYMBOL GEOLOGIC HAZARD

- DF - DEBRIS FLOW
- RF - ROCKFALL
- RS - ROCKSLIDE
- SR - SOIL RAVELING
- LS - LANDSLIDE
- HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

FILE No.	1 to 500 hazard.dwg
PROJECT No.	063-5782
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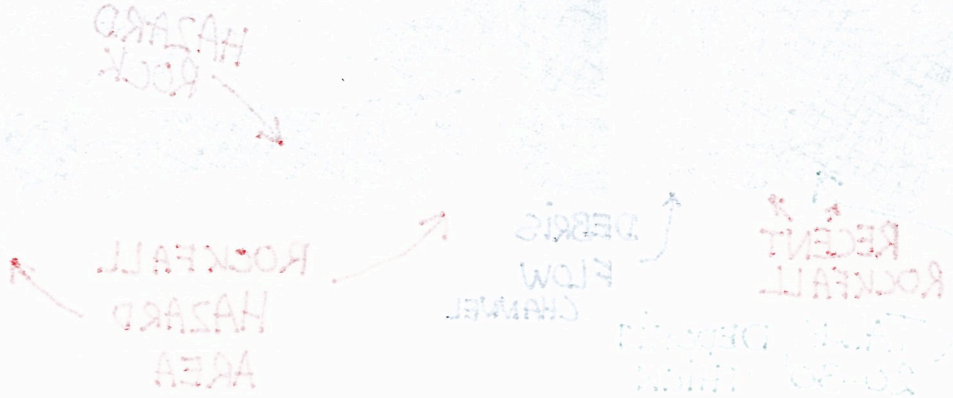
TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2543+00 - 2623+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 15



FROZEN WATERFALLS

HANGING ABOVE

PROPOSED ROAD



PANORAMIC VIEW
OF SINCLAIR AND
YELDAGAIGA AREA



Climber traversing

Peak 5900 ft.

Peak 4401 in background.

Very challenging terrain



PROFILE SHOT OF
EAST SIDE OF
Lynn CANAL.
PEAKS RISING STEEPLY
FROM TIDE WATER.



KATZEHIN RIVER DELTA

ROCKFALL HAZARD AREA

MEGA TALUS AND BOULDERS

New Ferry Terminal

2610+00
2615+00
2620+00
2625+00
2630+00
2635+00
2640+00
2645+00
2650+00
2655+00
2670+00

EXPLANATION:

APPROXIMATE HAZARD DELINEATION

SYMBOL	GEOLOGIC HAZARD
	DF - DEBRIS FLOW
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	RS - ROCKSLIDE
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	LS - LANDSLIDE
	HR - HAZARD ROCK

UPSLOPE MAPPING BOUNDARY

1530+00 INERTIAL REFERENCE POINT 2006 (IRP 2006) ALIGNMENT

N

0 500 1000
SCALE IN FEET

10 ft contour interval
50 ft Index contours

True North shown
23.5°East declination

REFERENCE: Base map from LIDAR provided by ADOT&PF.

Golder Associates
Anchorage, Alaska

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PROJECT No.	063-5782
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TITLE

PRELIMINARY GEOLOGIC HAZARD MAP

IRP 2006 2610+00-2670+00
LYNN CANAL, ALASKA

ADOT / LYNN CANAL HWY ZONE 4 / AK

FIGURE 16

APPROACHING KATZEHIN RIVER DELTA.

PROPOSED ROAD SKIRTS ALONG STEEP, ROCKY CLIFFS WITH BRIDGE SYSTEM OVER THE KATZEHIN RIVER DELTA.



ARRIVING@KATZEHIN proposed
FERRY TERMINAL

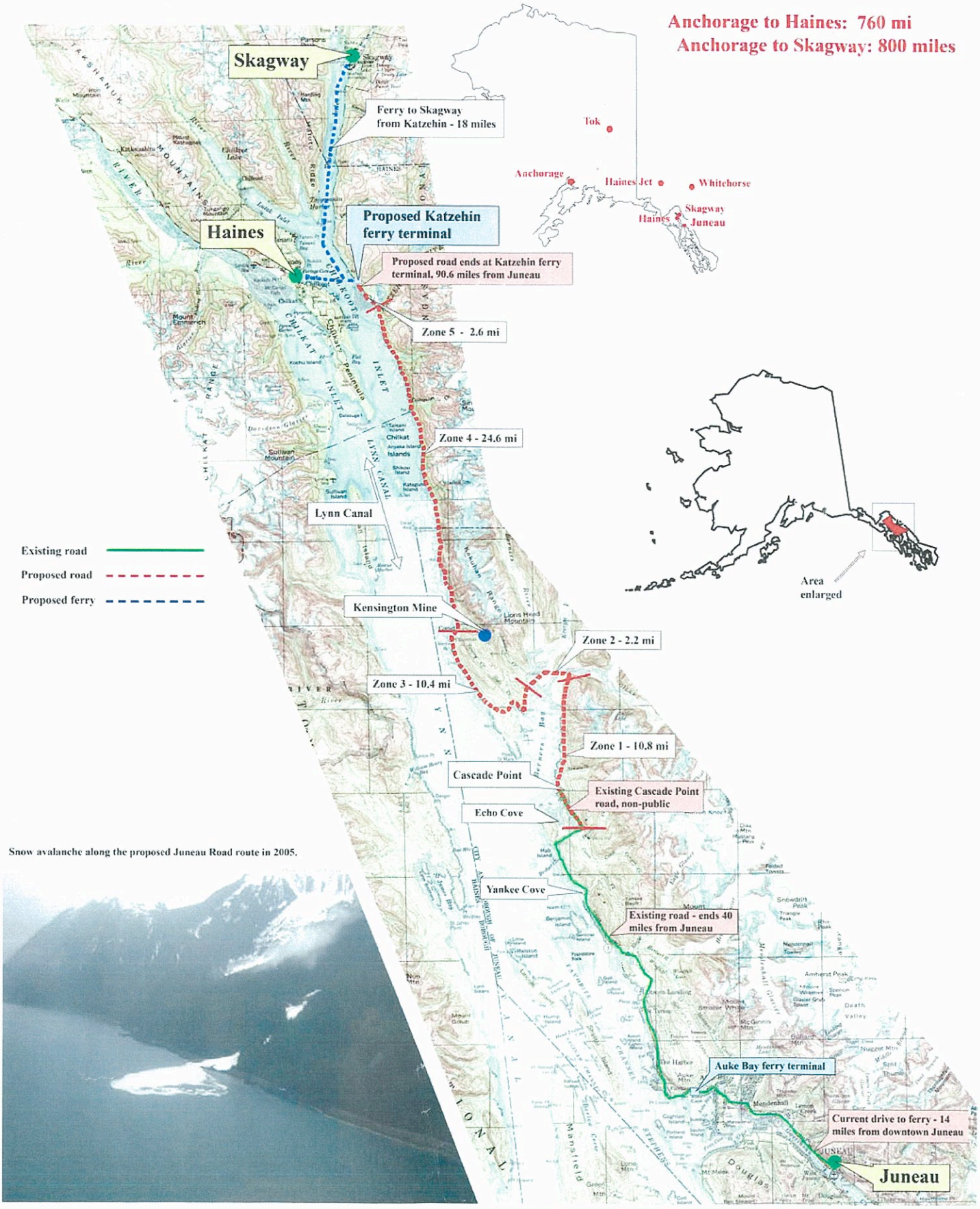
NOTE AVALANCHE CHUTE
ABOVE PROPOSED TERMINAL.


PROPOSED
NEW FERRY
TERMINAL

Cruise Ship Moving
Through upper Lynn Canal.

THE Cruise INDUSTRY HAS PROVEN
THAT MARINE TRANSPORTATION
IS DOABLE AND PRACTICAL.
OVER 900.000 PASSENGERS MOVE through
upper Lynn CANAL A SUMMER





Snow avalanche along the proposed Juneau Road route in 2005.

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On the Subject of a Lynn Canal Highway

As an adventurer and explorer who has spent alot of time accessing mountains along the East coastline of the Upper Lynn Canal, it has become obvious to me that the State of Alaska's leadership has either chosen to ignore both professional and amateur assessments of the technical nightmare presented by this project, or they are not being properly informed of the material compiled which obviously displays a plethora of drawbacks.

The mythical "center line" established last year by DOT is basically no more that a "we've seen it at eye level" gesture. Higher echelon bureaucrats who will be taking the responsibility for the excessive cost and inevitable drawbacks which will plague this project should take a ride in a small boat and even try to walk a part of this coastline before considering moving ahead. This has always been the problem, the people that need to experience the insanity by checking out the scene never seem to get to the locations in question, they simply rely on information the "Planners" want them to see.

The assumption that this will be a "coastal" afternoon drive couldn't be more iniquitous. It will feel like more of a mountain highway with a series of major cliffs dropping into the sea to have to deal with, either by drilling and shooting tunnels or having to cut switch backs up the steep mountainside. Winter maintenance will be horrendous and require resources from other venues which already are lacking in manpower, equipment, and funding to keep our existing road systems operational.

I worked with DOT during the construction of the Klondike Highway as a surveyor and inspector. We staked centerline up through the notorious "Boulder Field" and the "Slabs of doom" which required ropes and harnesses. As a surveyor I soon realized that yes, a road certainly can be built anywhere depending on the tenacity of the builders and unlimited funding. But this comparison I've heard of the proposed road to the Klondike Highway is laughable. The terrain is more unstable geologically and subject to endless avalanches and washouts. The construction aspect will be more extreme and physically demanding.

The Klondike was also built for around a million dollars a mile and had a predicted death count of 2,(which was a reality in the end). It was also only a 7 mile road and took 3 years to build!

As a business man in Haines I have always considered the Upper Lynn Canal as a national treasure which should never be disfigured, especially when we have a world class ferry system which visitors from around the world love to ride. These visitors endlessly voice their awesome admiration of the beautiful ferry ride underneath the towering mountains.

Any true Alaskan's who respect and cherish our great state should never consider disfiguring one of our features so popular and unique to the rest of the world. We owe it to our future generations to not forsake this 40 miles of coastline, or they will look back at us as being thoughtless and badly governed.

John Svenson

JOHN E. SVENSON

2/7/08

STATE OF ALASKA

SARAH PALIN, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

SOUTHEAST REGIONAL DIRECTOR'S OFFICE

PO Box 112506
JUNEAU, AK 99801-799

PHONE: (907) 465-176
TTY/TDD: (907) 465-464
FAX: (907) 465-2016

December 4, 2007

Mr. Mike Miller

Department of Transportation-SE Region
PO Box 112506
Juneau, AK. 99811

RE: Photo Essay
Return of Hard Copy

Dear Mike:

Thank you for visiting my office and discussing your work effort in hiking the general route of Lynn Canal Highway, and preparing the summary titled "Photo Essay of the Terrain on the Eastside of Lynn Canal". I found your essay interesting and did pass it around to various staff members.

During our discussion you questioned if the highway could be build and how. I have attached a technical paper on the construction of our Klondike Highway. Within that document, construction methods are described and photographs provided. There are many similarities in the routes. I hope you find the paper of interest.

Also within your essay, you have "concerns and questions". I have briefly responded to such on a separate page.

Again, thank you.

Sincerely,
DOT & PF-Southeast Region

Malcolm A. Menzies, P.E., L.S.
Regional Director

CONCERNS AND QUESTIONS

-The biggest question here is: *Will* this highway provide improved and reliable transportation to Juneau?

Response: Yes it will. Our studies reflect that and recent polls by Representative Doll reflect that her district favors road access.

-Is it in the public's best interest to build such an unpredictable and hazardous highway to a new ferry terminal, while we have a marine option?

Response: Yes, the expense, both short and long term to the state and its citizens cannot continue.

-Is the DOT/PF underestimating the true cost, feasibility, and scale of this project?

Response: No. Recent bids on this and other projects have been used.

-Does the most recent cost estimate of this project include?

- snow sheds, bridges, and possible rock tunnels

  Response: No on sheds, yes on bridges; yes on cut and cover (tubes vs. tunnels)

- avalanche control such as: helicopters triggering avalanches, mounting of cannons up and down the fjord

  Response: No cannon at this time, helicopter as used in Alaska and Colorado

- removal of avalanche debris, and plowing of snow and ice

  Response: Yes, our maintenance costs are current

- maintaining the 42 unpredictable debris flow hazards

  Response: Yes

- dealing with the numerous unpredictable rock fall hazards

  Response: Known dangers will be accounted for in design and construction

- Is the maintenance of this proposed road far more involved than anyone can predict?

  Response: No

- Has there been any serious thought about highway safety, such as: highway patrol and ambulance service? Who's paying? Does this project have the communities support?

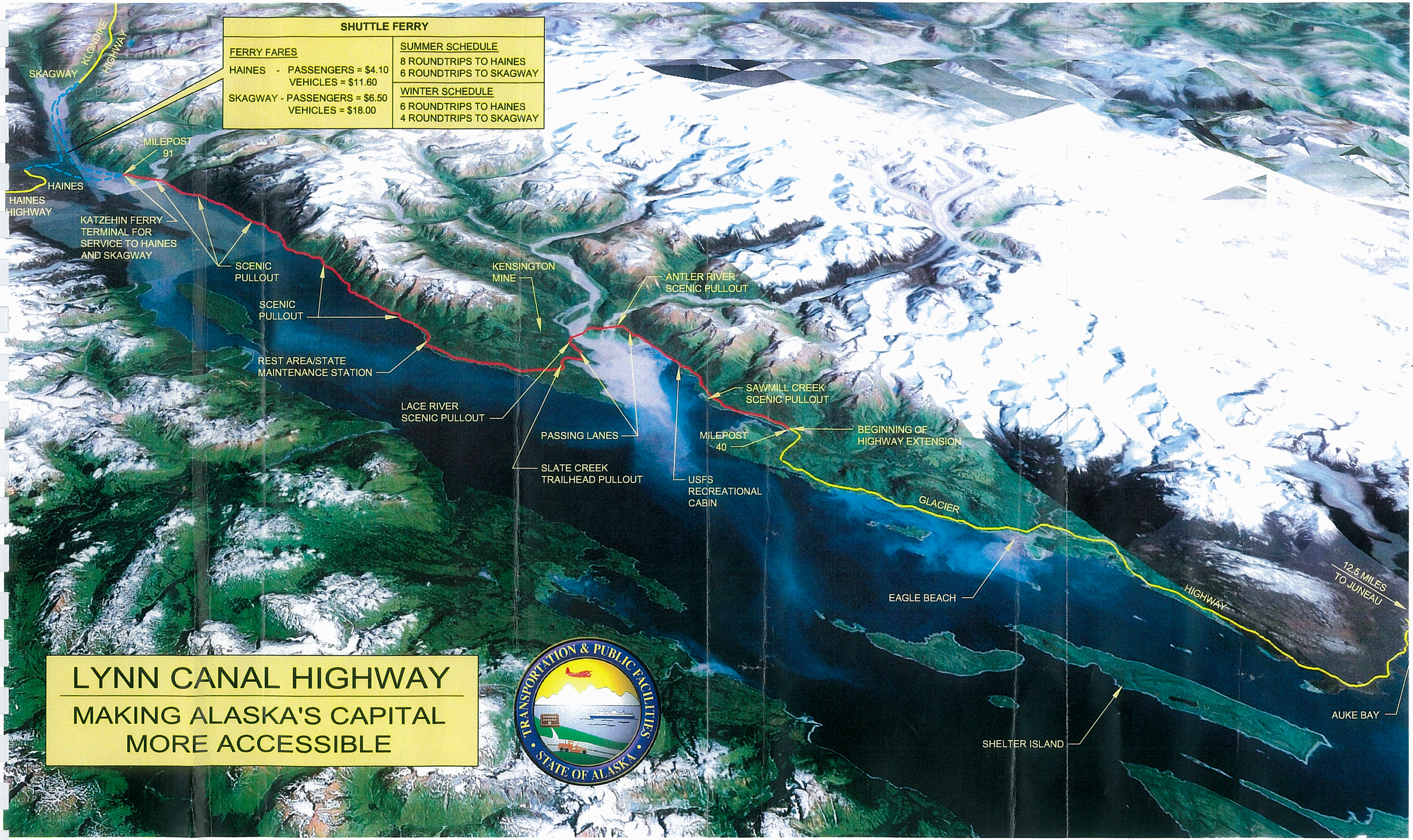
Response: Yes to all. By Representative Doll's poll there is community support.

-Habitat loss: The animals that live at the base of the Kakuhan range would have no opportunity to find new habitat because they live in the narrow strip of habitable terrain, between sub-alpine and the beach

Response: Habitat concerns are part of our EIS.

-If the cruise ship industry is able to move over 900,000 people through upper Lynn Canal in a few months, one would think that the State could provide affordable, reliable marine transportation for its communities.

Response: Alaska, by its ferry system, had not been able to provide affordable, reliable marine transport. For every $1.00 AMHS users spend the State presently spends over $2.30 in subsidys.


SHUTTLE FERRY
FERRY FARES
HAINES - PASSENGERS = $4.10
VEHICLES = $11.60
SKAGWAY - PASSENGERS = $6.50
VEHICLES = $18.00
SUMMER SCHEDULE
8 ROUNDTRIPS TO HAINES
6 ROUNDTRIPS TO SKAGWAY
WINTER SCHEDULE
6 ROUNDTRIPS TO HAINES
4 ROUNDTRIPS TO SKAGWAY
SKAGWAY
KLONDIKE HIGHWAY
MILEPOST 91
HAINES
HAINES HIGHWAY
KATZEHIN FERRY TERMINAL FOR SERVICE TO HAINES AND SKAGWAY
SCENIC PULLOUT
SCENIC PULLOUT
REST AREA/STATE MAINTENANCE STATION
KENSINGTON MINE
ANTLER RIVER SCENIC PULLOUT
SAWMILL CREEK SCENIC PULLOUT
LACE RIVER SCENIC PULLOUT
PASSING LANES
SLATE CREEK TRAILHEAD PULLOUT
USFS RECREATIONAL CABIN
MILEPOST 40
BEGINNING OF HIGHWAY EXTENSION
GLACIER
EAGLE BEACH
HIGHWAY
12.5 MILES TO JUNEAU
AUKE BAY
SHELTER ISLAND
LYNN CANAL HIGHWAY
MAKING ALASKA'S CAPITAL MORE ACCESSIBLE
TRANSPORTATION & PUBLIC FACILITIES
STATE OF ALASKA

mike kelly

Table 1, Avalanche Hazard Index (AHI) Comparison

Highway	Unmitigated AHI	Daily Observations & Forecasts	Forecasting, Closure, & Explosives	Structural Mitigation	Special Explosives Methods
Rogers Pass, BC	**1004**	x	x	x	x
Red Mtn. Pass, CO	**335**	x	x	x	
* Seward Highway, AK (Anchorage-Seward, old alignment)	**331**	x	x	x	
East Lynn, AK	**205**	x	x	x	
* Seward Highway, AK (Anchorage-Girdwood, old alignment)	**188**	x	x	x	
Coal Bank/Molas, CO	**108**	x	x		
West Lynn, AK	**100**	x	x	x	
Berthoud Pass, CO	**93**	x	x		
Coquihalla, BC	**90**	x	x	x	x
Loveland Pass, CO	**80**	x	x		
Wolf Creek Pass, CO	**54**	x	x	x	
Silverton-Gladstone, CO	**49**	x	x		
Teton Pass, WY	**47**	x	x		x
Lizard Head Pass, CO	**39**	x	x		
I-70 Tunnel Approaches, CO	**27**	x	x	x	

* Historical data for AHI calculation is only available for the pre-1998 Seward Highway alignment.

Table 6
East Lynn Canal Avalanche Paths by AHI

Path #	Path Group	Unmitigated AHI
ELC021	S Yeldagalga	94.84
ELC006	Eldred Rock	21.18
ELC019	S Yeldagalga	17.30
ELC020	S Yeldagalga	10.21
ELC002	N Kensington	7.72
ELC026	N Yeldagalga	7.55
ELC025	N Yeldagalga	6.41
ELC040B	Haines Area	5.48
ELC029	N Yeldagalga	4.60
ELC014	Eldred Rock	3.58
ELC024	S Yeldagalga	3.18
ELC049	Schubee	3.07
ELC043	N Dayebas	2.59
ELC051	Schubee	2.21
ELC040C	Haines Area	2.12
ELC010	Eldred Rock	1.83
ELC011	Eldred Rock	1.50
ELC003	N Kensington	0.97
ELC023	S Yeldagalga	0.89
ELC046	N Dayebas	0.83
ELC009	Eldred Rock	0.72
ELC028	N Yeldagalga	0.61
ELC013	Eldred Rock	0.59
ELC050	Schubee	0.55
ELC001	Berners Bay	0.49
ELC048	N Dayebas	0.33
ELC040A	Haines Area	0.32
ELC008	Eldred Rock	0.31
ELC045	N Dayebas	0.27
ELC030	N Yeldagalga	0.25
ELC040F	Haines Area	0.24
ELC052	Taiya Inlet	0.17
ELC018	S Yeldagalga	0.17
ELC035	N Katzehin	0.17
ELC053-1	Taiya Inlet	0.17
ELC040D	Haines Area	0.16
ELC027	N Yeldagalga	0.15
ELC047	N Dayebas	0.14
ELC026-1	N Yeldagalga	0.13
ELC053	Taiya Inlet	0.13
ELC012	Eldred Rock	0.12
ELC022	S Yeldagalga	0.12
ELC051-1	Taiya Inlet	0.11
ELC041	N Dayebas	0.11
ELC017	S Yeldagalga	0.10
ELC005	Eldred Rock	0.08
ELC004	N Kensington	0.06
ELC040E	Haines Area	0.05
ELC007	Eldred Rock	0.05
ELC042	N Dayebas	0.04
ELC028-2	N Yeldagalga	0.04
ELC036	N Katzehin	0.03
ELC034	S Katzehin	0.03
ELC037	N Katzehin	0.02
ELC044	N Dayebas	0.02
ELC032	S Katzehin	0.02
ELC031	N Yeldagalga	0.02
ELC033	S Katzehin	0.009
ELC028-1	N Yeldagalga	0.007
ELC038	N Katzehin	0.005
ELC055	Skagway Area	0.003
*ELC003-1	N Kensington	0.000
*ELC005-1	Eldred Rock	0.000
*ELC015	Eldred Rock	0.000
*ELC016	S Yeldagalga	0.000
*ELC019-1	S Yeldagalga	0.000
*ELC039	N Katzehin	0.000
*ELC054	Taiya Inlet	0.000
*ELC056	Skagway Area	0.000
*ELC056-1	Skagway Area	0.000
*ELC056-2	Skagway Area	0.000
*ELC057	Skagway Area	0.000
*ELC058	Skagway Area	0.000
*ELC059	Skagway Area	0.000
	Total AHI	**205.17**
# Paths Affecting Alignment		61.00

TABLE 4
ALL HAZARDS SORTED BY ASCENDING IRP 2006 LOCATION

IRP 2006 Location	Hazard ID#	Hazard Type	Hazard Index Number (HIN)	Geologic Hazard Rating System	IRP 2006 South Margin	IRP 2006 North Margin	Photo #	Bounds	Impact Alignment	Frequency (yrs)	Material Volume (CY)	Source Elevation (ft)	Alignment Exposure (ft)	Predictability	Source Material	Centerline Slope	Clast Size (ft)	Alignment Location	Slope Angle (degrees)	Slope Drainage	Vegetation	Tension Cracks	Seeps	Tilting Trees	Curving Trunks	Deciduous Trees
1493	DF01	debris_flow	225	A	1492+90	1498+90	4098, 4099, 5146	-	yes	1-5	100-1000	>1000	500+	moderate	Qc	fan	1-2	deposition_zone	30-40	into_slide	denuded	other	no	no	no	yes
1515	DF02	debris_flow	129	A	1514+50	1515+50	1515, 2036, 5865	upalignment	yes	1-5	<10	2000-3000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1517	DF03	debris_flow	183	A	1517+00	1518+20	3893, 5148, 5865, 6256	upalignment	yes	0-1	<10	2000-3000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1522	RS01	rock_slide	219	A	1521+80	1525+50	4123, 4124, 4126, 5148, 5865	-	no	unk(>25?)	100-1000	>1000	200-500	unpredictable	Bxv	open_bedrock_slope	4+	deposition_zone	60+	unk	denuded	yes	no	no	no	no
1549	RF01	rockfall	147	C	1549+00	1552+50	4212, 4214, 5148	upalignment	no	1-5	<10	100-500	200-500	unpredictable	Bxv	open_soil_slope	3-4	below_deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
1553	RF02	rockfall	111	C	1553+00	1554+00	3049, 5149	downalignment	no	5-25	<10	100-500	50-200	unpredictable	Bxv	open_soil_slope	0-1	below_deposition_zone	50-60	unk	disturbed	no	yes	no	no	yes
1586	RF03	rockfall	129	B	1584+50	1587+00	4259, 5873	mid	yes	5-25	<10	100-500	200-500	unpredictable	Bxv	single_channel	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
1609	RF04	rockfall	183	B	1605+50	1611+10	4245, 4246, 4247, 4249	downslope	yes	unk(5-25?)	<10	100-500	500+	unpredictable	Bxv	open_soil_slope	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
1657	RF05	rockfall	105	B	1657+00	1658+00	1086, 3904 to 3908, 5154, 6266	upalignment	yes	5-25	<10	<100	50-200	unpredictable	Bxv	open_bedrock_slope	4+	deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
1670	DF04	debris_flow	117	B	1668+50	1670+50	3875	downalignment	yes	5-25	10-100	1000-2000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1674	DF05	debris_flow	129	A	1673+80	1675+30	6203, 6204	upalignment	yes	1-5	10-100	1000-2000	50-200	high	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	denuded	no	no	no	no	no
1678	DF06	debris_flow	201	A	1677+00	1679+00	3876	downalignment	yes	0-1	10-100	2000-3000	200-500	high	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1704	DF07	debris_flow	171	A	1701+50	1705+50	4366, 5155	upalignment	yes	1-5	100-1000	>1000	200-500	moderate	Qc	multi_channel	1-2	deposition_zone	30-40	Into_slide	denuded	no	no	no	no	yes
1720	DF08	debris_flow	129	A	1719+90	1720+80	1126, 5156	upslope	yes	1-5	10-100	>1000	50-200	high	Qc	fan	1-2	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
1730	RF06	rockfall	183	A	1729+90	1730+80	4674, 6206	mid	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	open_bedrock_slope	3-4	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
1733	DF09	debris_flow	153	A	1732+50	1734+40	3307	upslope	yes	unk(1-5?)	10-100	>1000	50-200	low	Qc	single_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
1734	RF07	rockfall	279	A	1724+80	1739+80	4674	upslope	yes	0-1	10-100	500-1000	500+	unpredictable	Bxmg	open_bedrock_slope	4+	deposition_zone	>60	into_slide	disturbed	no	no	no	no	yes
1743	DF10	debris_flow	129	A	1742+50	1743+40	4745 to 4748	mid	yes	1-5	10-100	>1000	50-200	high	Qc	multi_channel	0-1	path	40-50	into_slide	denuded	no	no	no	no	no
1748	DF11	debris_flow	129	A	1746+40	1748+20	4741, 4742, 5157	downalignment	yes	1-5	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
1752	DF12	debris_flow	111	A	1751+00	1752+00	4738, 4739, 5157	mid	yes	5-25	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1757	DF13	debris_flow	129	A	1756+10	1757+50	4736, 4737, 5157	downalignment	yes	1-5	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
1759	RF08	rockfall	183	A	1759+30	1767+00	5157, 5039, 5040, 5041, 6209	upalignment	yes	5-25	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	no
1763	RF09	rockfall	129	A	1763+20	1763+80	3878	upalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
1773	DF14	debris_flow	111	A	1772+50	1773+60	2093, 4714	downalignment	yes	25+	10-100	>1000	50-200	moderate	Qc	single_channel	2-3	path	30-40	into_slide	disturbed	no	no	no	no	no
1782	DF15	debris_flow	207	B	1782+00	1783+00	3912	-	yes	5-25	1000+	>1000	200-500	moderate	Qc	multi_channel	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1783	DF16	debris_flow	225	A	1783+00	1785+30	1141, 2091, 5158	upalignment	yes	1-5	1000+	>1000	200-500	moderate	Qc	multi_channel	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1824	DF17	debris_flow	147	B	1824+10	1825+50	1186, 4012, 4015, 5159, 6232,	upalignment	yes	25+	10-100	2000-3000	200-500	low	Qc	fan	1-2	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1826	DF18	debris_flow	147	A	1825+50	1827+50	1186, 4012, 4015, 5159, 6232,	upalignment	yes	1-5	10-100	2000-3000	200-500	high	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
1847	DF19	debris_flow	153	A	1845+30	1849+90	4809, 4812, 4830, 5160	upalignment	yes	5-25	10-100	3000+	200-500	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
1852	DF20	debris_flow	153	B	1852+00	1853+10	1210, 5160	downalignment	yes	5-25	10-100	3000+	200-500	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
1854	RF10	rockfall	111	C	1853+30	1854+30	4816	downslope	no	unk(5-25?)	<10	100-500	50-200	unpredictable	Bxms	other	2-3	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
1865	RF11	rockfall	105	B	1864+80	1866+00	6234	downslope	yes	5-25	<10	<100	50-200	unpredictable	Bxms	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
1894	DF21	debris_flow	123	B	1893+30	1894+40	5161, 6238	downalignment	yes	1-5	<10	2000-3000	50-200	high	Qc	single_channel	0-1	path	30-40	into_slide	disturbed	no	no	no	no	yes
1915	RF12	rockfall	105	C	1915+20	1916+50	5162	downslope	no	unk(>25?)	<10	100-500	50-200	unpredictable	Bxmg	-	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
1932	RF13	rockfall	111	C	1931+80	1933+00	5162	downslope	no	0-1	<10	100-500	50-200	moderate	Bxmg	-	1-2	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
1935	RF14	rockfall	129	B	1933+70	1953+00	5163, 5909 to 5911	downslope	yes	unk(5-25?)	<10	100-500	200-500	unpredictable	Bxmg	-	2-3	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	no
1948	RF15	rockfall	129	B	1946+80	1949+00	5163	-	yes	5-25	<10	100-500	200-500	unpredictable	Bxmg	other	4+	deposition_zone	>60	off_slide	disturbed	no	yes	no	no	yes
1984	DF22	debris_flow	147	A	1983+30	1985+70	5047, 5164, 5914	mid	yes	1-5	10-100	2000-3000	200-500	high	Qc	fan	1-2	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	no
2015	RF16	rockfall	129	B	2015+00	2017+40	5052, 5053, 6240	upalignment	yes	unk(5-25?)	<10	100-500	200-500	unpredictable	Bxms	deciduous_trees	3-4	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
2038	DF23	debris_flow	117	A	2041+20	2042+70	5057, 5166	upalignment	yes	5-25	10-100	3000+	50-200	moderate	Qc	multi_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
2042	SR01	soil_raveling	171	B	2043+40	2050+10	5090, 5166, 6244	upalignment	yes	0-1	<10	<100	500+	high	Qc	open_soil_slope	1-2	path	40-50	off_slide	disturbed	no	no	no	no	yes
2054	DF24	debris_flow	207	B	2054+40	2056+50	2054, 2239, 3462, 3463, 5093, 6195	upalignment	yes	1-5	10-100	3000+	50-200	high	Qc	multi_channel	1-2	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
2055	DF25	debris_flow	129	B	2056+50	2059+00	3462, 3463, 5093, 6195	upalignment	yes	5-25	<10	3000+	200-500	moderate	Qc	fan	0-1	deposition_zone	>60	into_slide	disturbed	no	no	no	no	no
2056	DF26	debris_flow	129	B	2059+00	2060+50	2241, 3470, 6195	upalignment	yes	1-5	10-100	3000+	200-500	high	Qc	fan	0-1	deposition_zone	50-60	-	disturbed	no	no	no	no	yes
2088	DF27	debris_flow	129	B	2088+00	2089+00	3885, 5167, 5924, 6247	upalignment	yes	5-25	<10	2000-3000	50-200	low	Qc	open_soil_slope	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	no	no	yes
2104	DF28	debris_flow	183	A	2102+30	2103+70	3886, 5916	downalignment	yes	0-1	10-100	3000+	50-200	high	Qc	fan	3-4	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
2114	DF29	debris_flow	153	A	2115+00	2117+40	5125, 5926, 6248	upalignment	yes	1-5	10-100	3000+	200-500	moderate	Qc	fan	1-2	deposition_zone	>60	into_slide	denuded	no	no	no	no	yes
2123	DF30	debris_flow	135	B	2123+00	2123+90	5168, 5927, 6250	downalignment	yes	5-25	10-100	1000-2000	50-200	low	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	no	no	yes
2129	RF17	rockfall	201	A	2129+00	2130+00	5928, 6251	upalignment	yes	1-5	<10	1000-2000	50-200	unpredictable	Bxmg	open_soil_slope	3-4	path	50-60	unk	disturbed	no	no	no	no	yes
2130	SR02	soil_raveling	171	B	2129+40	2129+80	3889, 5168	upalignment	yes	0-1	<10	<100	<50	unpredictable	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	yes	yes	yes
2134	RF18	rockfall	105	C	2134+00	2134+50	1751, 3490, 5169, 5929	downslope	no	unk(5-25?)	10-100	<100	<50	unpredictable	Bxm	open_bedrock_slope	1-2	starting_zone	30-40	unk	-	no	no	no	no	no
2142	DF31	debris_flow	111	A	2140+50	2142+30	5168, 5169, 5929, 5930	downalignment	yes	5-25	10-100	3000+	50-200	high	Qc	multi_channel	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
2144	RF19	rockfall	273	A	2142+70	2150+30	1357, 3491, 3493, 3495, 3498, 5130, 5168	mid	yes	1-5	<10	3000+	500+	unpredictable	Bxmg	fan	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2145	RF20	rockfall	165	A	2144+60	2146+80	1357, 3491, 3493, 3495, 3498, 5130, 5131, 5168	downslope	yes	1-5	<10	500-1000	200-500	unpredictable	Bxmg	fan	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2154	RF21	rockfall	147	C	2154+00	2155+00	6014	-	no	1-5	<10	500-1000	50-200	unpredictable	Bxmg	-	2-3	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
2205	LS01	landslide	183	C	2204+00	2208+00	5171	-	no	unk(>25?)	10-100	1000-2000	<50	unpredictable	Bxmg	-	-	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	no
2207	DF32	debris_flow	51	B	2206+60	2207+20	6018	downalignment	yes	5-25	<10	500-1000	50-200	high	Qc	single_channel	0-1	path	40-50	into_slide	disturbed	no	no	no	no	yes
2220	LS02	translational_slide	135	C	2219+60	2221+00	5000, 5937	mid	no	1-5	10-100	100-500	50-200	unpredictable	Qc	-	0-1	below_deposition_zone	50-60	unk	denuded	no	no	yes	no	yes
2250	DF33	debris_flow	183	B	2252+50	2252+80	6023	mid	yes	unk(5-25?)	10-100	3000+	<50	unpredictable	Qc	single_channel	1-2	path	40-50	into_slide	denuded	no	no	no	no	no
2254	RF22	rockfall	147	B	2253+30	2253+80	5941, 6024	mid	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	single_channel	1-2	path	50-60	into_slide	disturbed	no	no	no	no	no
2256	RF23	rockfall	147	B	2254+90	2258+10	3505	downslope	yes	unk(1-5?)	<10	100-500	200-500	unpredictable	Bxmg	other	0-1	deposition_zone	>60	unk	disturbed	no	no	no	no	no
2260	RF24	rockfall	147	C	2258+90	2261+00	3507	downslope	no	unk(1-5?)	<10	100-500	200-500	unpredictable	Bxmg	-	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2261	RS02	rock_slide	81	A	2261+10	2261+80	3508, 3510, 3511	mid	yes	1-5	10-100	500-1000	50-200	moderate	Bxmg	single_channel	1-2	path	50-60	into_slide	disturbed	no	no	no	no	no
2265	SR03	soil_raveling	147	B	2263+50	2267+40	5579, 5580, 5581	mid	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	open_bedrock_slope	2-3	path	50-60	unk	disturbed	no	no	no	no	yes
2281	DF34	debris_flow	147	B	2283+70	2287+10	3527, 3528	upalignment	yes	1-5	10-100	3000+	200-500	high	Qct	fan	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
2291	RF25	rockfall	123	B	2290+60	2291+00	3531	upslope	yes	unk(1-5?)	10-100	<100	<50	unpredictable	Bxms	open_bedrock_slope	2-3	deposition_zone	>60	unk	denuded	no	no	yes	yes	yes
2296	DF35	debris_flow	207	B	2293+80	2294+90	3535	downalignment	yes	unk(1-5?)	10-100	3000+	50-200	unpredictable	Qct	fan	3-4	deposition_zone	>60	into_slide	disturbed	no	no	no	no	yes
2300	LS03	translational_slide	111	C	2299+10	2299+60	5269, 5946	mid	no	25+	10-100	100-500	50-200	unpredictable	Qc	-	1-2	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
2301	RF26	rockfall	117	B	2300+20	2301+10	3559, 3560, 5946	downslope	yes	unk(5-25?)	10-100	100-500	50-200	unpredictable	Bxmg	other	4+	deposition_zone	>60	unk	undisturbed	yes	no	no	no	no
2308	RF27	rockfall	165	B	2303+50	2308+40	3561	mid	yes	1-5	<10	500-1000	200-500	unpredictable	Bxmg	fan	2-3	deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
2310	DF36	debris_flow	129	B	2311+10	2311+80	3562	mid	yes	1-5	10-100	1000-2000	50-200	high	Qc	fan	0-1	path	>60	into_slide	denuded	no	no	no	no	yes
2321	DF37	debris_flow	129	B	2321+20	2322+10	3564, 3565, 3566	upalignment	yes	1-5	10-100	1000-2000	50-200	high	Qc	fan	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
2322	RF28	rockfall	183	A	2322+10	2322+70	3891, 5948, 6254	downslope	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	single_channel	1-2	path	>60	unk	disturbed	no	yes	no	no	yes
2328	RF29	rockfall	105	B	2328+10	2329+10	6140	mid	yes	25+	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	3-4	path	>60	unk	disturbed	no	no	no	no	no
2332	RF30	rockfall	135	B	2331+40	2332+80	6142, 6143	mid	no	5-25	10-100	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
2335	RF31	rockfall	129	A	2334+70	2335+60	6144, 6145	mid	yes	5-25	<10	500-1000	50-200	unpredictable	Bxmg	single_channel	4+	deposition_zone	>60	unk	denuded	no	no	no	no	yes

TABLE 4
ALL HAZARDS SORTED BY ASCENDING IRP 2006 LOCATION

IRP 2006 Location	Hazard ID#	Hazard Type	Hazard Index Number (HIN)	Geologic Hazard Rating System	IRP 2006 South Margin	IRP 2006 North Margin	Photo #	Bounds	Impact Alignment	Frequency (yrs)	Material Volume (CY)	Source Elevation (ft)	Alignment Exposure (ft)	Predictability	Source Material	Centerline Slope	Clast Size (ft)	Alignment Location	Slope Angle (degrees)	Slope Drainage	Vegetation	Tension Cracks	Seeps	Tilting Trees	Curving Trunks	Deciduous Trees
2338	DF38	debris_flow	129	A	2338+00	2338+90	6146	mid	yes	1-5	10-100	2000-3000	50-200	high	Qc	single_channel	0-1	path	40-50	into_slide	denuded	no	no	no	no	no
2365	RF33	rockfall	255	B	2364+20	2370+50	3724, 3725	downslope	yes	0-1	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2370	RF32	rockfall	201	B	2361+10	2364+20	3724, 3725	downalignment	yes	0-1	<10	100-500	200-500	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2374	HR01	hazard_rock	99	C	2374+90	-	3722	upalignment	yes	unk(>25?)	10-100	<100	<50	unpredictable	Qct	open_soil_slope	4+	below_deposition_zone	40-50	unk	undisturbed	no	no	no	no	no
2380	HR02	hazard_rock	99	C	2379+40	2380+90	3719	upslope	yes	unk(>25?)	<10	<100	50-200	unpredictable	Qct	open_soil_slope	4+	deposition_zone	40-50	unk	disturbed	no	no	no	no	no
2383	RF34	rockfall	177	B	2382+50	2388+50	3712, 3715	upalignment	no	25+	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	4+	below_deposition_zone	>60	unk	undisturbed	no	no	no	no	yes
2388	RF35	rockfall	183	B	2388+00	2388+80	3706	downslope	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	0-1	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2420	SR04	soil_raveling	105	B	2420+70	2426+80	3595 to 3598, 5957, 6061	upalignment	yes	5-25	<10	<100	500+	moderate	Qc	open_soil_slope	3-4	path	40-50	into_slide	disturbed	no	no	no	yes	no
2426	LS04	translational_slide	33	B	2426+80	2427+40	3595, 3597, 3598, 6074	upalignment	yes	5-25	<10	<100	50-200	moderate	Qc	open_soil_slope	3-4	path	40-50	into_slide	disturbed	no	no	yes	yes	no
2454	RF36	rockfall	129	B	2454+50	2455+00	3609, 5960	downslope	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	-	3-4	below_deposition_zone	>60	unk	denuded	no	yes	no	no	yes
2457	LS05	translational_slide	129	C	2456+00	2458+00	3615, 5961, 6077	upslope	no	5-25	<10	100-500	200-500	unpredictable	Qct	-	3-4	below_deposition_zone	30-40	unk	disturbed	no	no	no	yes	yes
2459	DF40	debris_flow	135	B	2459+00	2459+90	3616, 5180, 5961	mid	yes	5-25	10-100	2000-3000	50-200	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	no
2460	DF41	debris_flow	129	B	2460+40	2461+00	3616	mid	yes	1-5	10-100	3000+	50-200	high	Qc	fan	0-1	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
2467	RF37	rockfall	69	B	2466+10	2470+00	3637, 5181, 5962	upalignment	yes	1-5	<10	100-500	200-500	high	Bxmg	open_soil_slope	4+	path	>60	into_slide	disturbed	no	no	no	no	yes
2473	RF38	rockfall	33	B	2473+00	2474+00	6092	mid	yes	5-25	<10	100-500	50-200	high	Bxmg	single_channel	1-2	path	>60	into_slide	disturbed	no	no	yes	no	yes
2481	RF39	rockfall	129	B	2480+30	2481+50	6083, 6084	downslope	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	other	3-4	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2487	RF40	rockfall	147	B	2484+00	2488+70	5182, 5964, 6085,	downslope	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	-	3-4	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
2491	DF42	debris_flow	117	B	2490+70	2491+30	6086	downslope	yes	5-25	10-100	1000-2000	50-200	moderate	Qc	single_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
2495	RF41	rockfall	129	C	2495+00	2505+00	5965, 6094, 6095	upalignment	yes	1-5	<10	100-500	500+	moderate	Bxmg	open_soil_slope	2-3	path	>60	into_slide	disturbed	no	no	no	no	yes
2502	RF42	rockfall	105	B	2499+50	2505+00	6094, 6095	downslope	yes	unk(5-25?)	<10	<100	500+	moderate	Bxmg	deciduous_trees	0-1	path	40-50	unk	denuded	yes	no	no	no	yes
2518	HR03	hazard_rock	93	C	2517+80	-	5311, 5312	downslope	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	-	4+	below_deposition_zone	40-50	-	-	no	no	no	no	no
2526	HR04	hazard_rock	93	C	2526+00	-	5318	-	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	-	4+	below_deposition_zone	40-50	-	-	no	no	no	no	no
2529	RF43	rockfall	129	A	2528+00	2529+70	3648, 5969	downalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
2531	RF44	rockfall	147	B	2531+00	2533+20	1565, 5326, 5327	downslope	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	no
2537	RF45	rockfall	129	A	2536+10	2537+80	6098, 6099	downalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	-	1-2	deposition_zone	40-50	unk	-	no	no	no	no	no
2548	RF46	rockfall	111	A	2546+70	2548+30	5338, 5339	mid	yes	5-25	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	yes	yes
2550	RF47	rockfall	183	B	2549+80	2556+30	3660	downslope	yes	5-25	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2552	LS06	landslide	129	C	2552+80	2554+00	5185, 5341, 5342	mid	no	unk(>25?)	10-100	500-1000	50-200	unpredictable	-	open_soil_slope	-	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
2554	HR05	hazard_rock	93	C	2554+30	-	5362, 5363	-	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	open_soil_slope	4+	below_deposition_zone	-	-	-	no	no	no	no	no
2557	RF49	rockfall	201	C	2556+50	2562+00	3661, 3662, 3664	downslope	no	1-5	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	2-3	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
2558	RF50	rockfall	147	B	2557+80	2558+40	3661, 3662, 3664	upalignment	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	2-3	path	>60	unk	disturbed	no	no	no	no	yes
2560	RF51	rockfall	147	B	2559+30	2560+50	3661, 3662, 3664	mid	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	2-3	path	>60	unk	disturbed	no	no	no	no	yes
2561	LS07	landslide	129	C	2561+80	2562+80	5024	mid	no	unk(>25?)	10-100	500-1000	50-200	unpredictable	Qct	open_soil_slope	-	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
2563	DF43	debris_flow	63	A	2563+30	2564+10	5356	downalignment	yes	5-25	10-100	500-1000	50-200	moderate	Qct	single_channel	1-2	path	50-60	into_slide	denuded	no	no	no	no	yes
2568	RF52	rockfall	123	B	2564+70	2570+60	6105, 6106	downslope	yes	1-5	<10	100-500	500+	high	Bxmg	open_soil_slope	4+	path	>60	into_slide	disturbed	no	no	yes	no	yes
2620	RF53	rockfall	201	A	2618+90	2626+00	3683, 3684	downalignment	yes	25+	100-1000	100-500	500+	unpredictable	Bxmg	fan	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes

TABLE 5
ALL HAZARDS SORTED BY HAZARD TYPE AND ASCENDING HAZARD INDEX NUMBER (HIN)

Hazard Type	Hazard Index Number (HIN)	IRP 2006 Location	Hazard ID#	Geologic Hazard Rating System	IRP 2006 South Margin	IRP 2006 North Margin	Photo #	Bounds	Impact Alignment	Frequency (yrs)	Material Volume (CY)	Source Elevation (ft)	Alignment Exposure (ft)	Predictability	Source Material	Centerline Slope	Clast Size (ft)	Alignment Location	Slope Angle (degrees)	Slope Drainage	Vegetation	Tension Cracks	Seeps	Tilting Trees	Curving Trunks	Deciduous Trees
debris_flow	51	2207	DF32	B	2206+60	2207+20	6018	downalignment	yes	5-25	<10	500-1000	50-200	high	Qc	single_channel	0-1	path	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	63	2563	DF43	A	2563+30	2564+10	5356	downalignment	yes	5-25	10-100	500-1000	50-200	moderate	Qct	single_channel	1-2	path	50-60	into_slide	denuded	no	no	no	no	yes
debris_flow	111	1752	DF12	A	1751+00	1752+00	4738, 4739, 5157	mid	yes	5-25	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	111	1773	DF14	A	1772+50	1773+60	2093, 4714	downalignment	yes	25+	10-100	>1000	50-200	moderate	Qc	single_channel	2-3	path	30-40	into_slide	disturbed	no	no	no	no	no
debris_flow	111	2142	DF31	A	2140+50	2142+30	5168, 5169, 5929, 5930	downalignment	yes	5-25	10-100	3000+	50-200	high	Qc	multi_channel	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
debris_flow	117	1670	DF04	B	1668+50	1670+50	3875	downalignment	yes	5-25	10-100	1000-2000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	117	2038	DF23	A	2041+20	2042+70	5057, 5166	upalignment	yes	5-25	10-100	3000+	50-200	moderate	Qc	multi_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	117	2491	DF42	B	2490+70	2491+30	6086	downslope	yes	5-25	10-100	1000-2000	50-200	moderate	Qc	single_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	123	1894	DF21	B	1893+30	1894+40	5161, 6238	downalignment	yes	1-5	<10	2000-3000	50-200	high	Qc	single_channel	0-1	path	30-40	into_slide	disturbed	no	no	no	no	yes
debris_flow	129	1515	DF02	A	1514+50	1515+50	1515, 2036, 5865	upalignment	yes	1-5	<10	2000-3000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	129	1674	DF05	A	1673+80	1675+30	6203, 6204	upalignment	yes	1-5	10-100	1000-2000	50-200	high	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	denuded	no	no	no	no	no
debris_flow	129	1720	DF08	A	1719+90	1720+80	1126, 5156	upslope	yes	1-5	10-100	>1000	50-200	high	Qc	fan	1-2	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
debris_flow	129	1743	DF10	A	1742+50	1743+40	4745 to 4748	mid	yes	1-5	10-100	>1000	50-200	high	Qc	multi_channel	0-1	path	40-50	into_slide	denuded	no	no	no	no	no
debris_flow	129	1748	DF11	A	1746+40	1748+20	4741, 4742, 5157	downalignment	yes	1-5	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
debris_flow	129	1757	DF13	A	1756+10	1757+50	4736, 4737, 5157	downalignment	yes	1-5	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
debris_flow	129	2055	DF25	B	2056+50	2059+00	3462, 3463, 5093, 6195	upalignment	yes	5-25	<10	3000+	200-500	moderate	Qc	fan	0-1	deposition_zone	>60	into_slide	disturbed	no	no	no	no	no
debris_flow	129	2056	DF26	B	2059+00	2060+50	2241, 3470, 6195	upalignment	yes	1-5	10-100	3000+	200-500	high	Qc	fan	0-1	deposition_zone	50-60	-	disturbed	no	no	no	no	yes
debris_flow	129	2088	DF27	B	2088+00	2089+00	3885, 5167, 5924, 6247	upalignment	yes	5-25	<10	2000-3000	50-200	low	Qc	open_soil_slope	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	no	no	yes
debris_flow	129	2310	DF36	B	2311+10	2311+80	3562	mid	yes	1-5	10-100	1000-2000	50-200	high	Qc	fan	0-1	path	>60	into_slide	denuded	no	no	no	no	yes
debris_flow	129	2321	DF37	B	2321+20	2322+10	3564, 3565, 3566	upalignment	yes	1-5	10-100	1000-2000	50-200	high	Qc	fan	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
debris_flow	129	2338	DF38	A	2338+00	2338+90	6146	mid	yes	1-5	10-100	2000-3000	50-200	high	Qc	single_channel	0-1	path	40-50	into_slide	denuded	no	no	no	no	no
debris_flow	129	2460	DF41	B	2460+40	2461+00	3616	mid	yes	1-5	10-100	3000+	50-200	high	Qc	fan	0-1	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
debris_flow	135	2123	DF30	B	2123+00	2123+90	5168, 5927, 6250	downalignment	yes	5-25	10-100	1000-2000	50-200	low	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	no	no	yes
debris_flow	135	2459	DF40	B	2459+00	2459+90	3616, 5180, 5961	mid	yes	5-25	10-100	2000-3000	50-200	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	no
debris_flow	147	1824	DF17	B	1824+10	1825+50	1186, 4012, 4015, 5159, 6232,	upalignment	yes	25+	10-100	2000-3000	200-500	low	Qc	fan	1-2	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	147	1826	DF18	A	1825+50	1827+50	1186, 4012, 4015, 5159, 6232,	upalignment	yes	1-5	10-100	2000-3000	200-500	high	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	147	1984	DF22	A	1983+30	1985+70	5047, 5164, 5914	mid	yes	1-5	10-100	2000-3000	200-500	high	Qc	fan	1-2	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	no
debris_flow	147	2281	DF34	B	2283+70	2287+10	3527, 3528	upalignment	yes	1-5	10-100	3000+	200-500	high	Qct	fan	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
debris_flow	153	1733	DF09	A	1732+50	1734+40	3307	upslope	yes	unk(1-5?)	10-100	>1000	50-200	low	Qc	single_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	153	1847	DF19	A	1845+30	1849+90	4809, 4812, 4830, 5160	upalignment	yes	5-25	10-100	3000+	200-500	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
debris_flow	153	1852	DF20	B	1852+00	1853+10	1210, 5160	downalignment	yes	5-25	10-100	3000+	200-500	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
debris_flow	153	2114	DF29	A	2115+00	2117+40	5125, 5926, 6248	upalignment	yes	1-5	10-100	3000+	200-500	moderate	Qc	fan	1-2	deposition_zone	>60	into_slide	denuded	no	no	no	no	yes
debris_flow	171	1704	DF07	A	1701+50	1705+50	4366, 5155	upalignment	yes	1-5	100-1000	>1000	200-500	moderate	Qc	multi_channel	1-2	deposition_zone	30-40	Into_slide	denuded	no	no	no	no	yes
debris_flow	183	1517	DF03	A	1517+00	1518+20	3893, 5148, 5865, 6256	upalignment	yes	0-1	<10	2000-3000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	183	2104	DF28	A	2102+30	2103+70	3886, 5916	downalignment	yes	0-1	10-100	3000+	50-200	high	Qc	fan	3-4	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
debris_flow	183	2250	DF33	B	2252+50	2252+80	6023	mid	yes	unk(5-25?)	10-100	3000+	<50	unpredictable	Qc	single_channel	1-2	path	40-50	into_slide	denuded	no	no	no	no	no
debris_flow	201	1678	DF06	A	1677+00	1679+00	3876	downalignment	yes	0-1	10-100	2000-3000	200-500	high	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	207	1782	DF15	B	1782+00	1783+00	3912	-	yes	5-25	1000+	>1000	200-500	moderate	Qc	multi_channel	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
debris_flow	207	2054	DF24	B	2054+40	2056+50	2054, 2239, 3462, 3463, 5093, 6195	upalignment	yes	1-5	10-100	3000+	50-200	high	Qc	multi_channel	1-2	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
debris_flow	207	2296	DF35	B	2293+80	2294+90	3535	downalignment	yes	unk(1-5?)	10-100	3000+	50-200	unpredictable	Qct	fan	3-4	deposition_zone	>60	into_slide	disturbed	no	no	no	no	yes
debris_flow	225	1493	DF01	A	1492+90	1498+90	4098, 4099, 5146	-	yes	1-5	100-1000	>1000	500+	moderate	Qc	fan	1-2	deposition_zone	30-40	into_slide	denuded	other	no	no	no	yes
debris_flow	225	1783	DF16	A	1783+00	1785+30	1141, 2091, 5158	upalignment	yes	1-5	1000+	>1000	200-500	moderate	Qc	multi_channel	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
hazard_rock	93	2518	HR03	C	2517+80	-	5311, 5312	downslope	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	-	4+	below_deposition_zone	40-50	-	-	no	no	no	no	no
hazard_rock	93	2526	HR04	C	2526+00	-	5318	-	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	-	4+	below_deposition_zone	40-50	-	-	no	no	no	no	no
hazard_rock	93	2554	HR05	C	2554+30	-	5362, 5363	-	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	open_soil_slope	4+	below_deposition_zone	-	-	-	no	no	no	no	no
hazard_rock	99	2374	HR01	C	2374+90	-	3722	upalignment	yes	unk(>25?)	10-100	<100	<50	unpredictable	Qct	open_soil_slope	4+	below_deposition_zone	40-50	unk	undisturbed	no	no	no	no	no
hazard_rock	99	2380	HR02	C	2379+40	2380+90	3719	upslope	yes	unk(>25?)	<10	<100	50-200	unpredictable	Qct	open_soil_slope	4+	deposition_zone	40-50	unk	disturbed	no	no	no	no	no
landslide	129	2552	LS06	C	2552+80	2554+00	5185, 5341, 5342	mid	no	unk(>25?)	10-100	500-1000	50-200	unpredictable	-	open_soil_slope	-	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
landslide	129	2561	LS07	C	2561+80	2562+80	5024	mid	no	unk(>25?)	10-100	500-1000	50-200	unpredictable	Qct	open_soil_slope	-	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
landslide	183	2205	LS01	C	2204+00	2208+00	5171	-	no	unk(>25?)	10-100	1000-2000	<50	unpredictable	Bxmg	-	-	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	no
rock_slide	81	2261	RS02	A	2261+10	2261+80	3508, 3510, 3511	mid	yes	1-5	10-100	500-1000	50-200	moderate	Bxmg	single_channel	1-2	path	50-60	into_slide	disturbed	no	no	no	no	no
rock_slide	219	1522	RS01	A	1521+80	1525+50	4123, 4124, 4126, 5148, 5865	-	no	unk(>25?)	100-1000	>1000	200-500	unpredictable	Bxv	open_bedrock_slope	4+	deposition_zone	60+	unk	denuded	yes	no	no	no	no
rockfall	33	2473	RF38	B	2473+00	2474+00	6092	mid	yes	5-25	<10	100-500	50-200	high	Bxmg	single_channel	1-2	path	>60	into_slide	disturbed	no	no	yes	no	yes
rockfall	69	2467	RF37	B	2466+10	2470+00	3637, 5181, 5962	upalignment	yes	1-5	<10	100-500	200-500	high	Bxmg	open_soil_slope	4+	path	>60	into_slide	disturbed	no	no	no	no	yes
rockfall	105	1657	RF05	B	1657+00	1658+00	1086, 3904 to 3908, 5154, 6266	upalignment	yes	5-25	<10	<100	50-200	unpredictable	Bxv	open_bedrock_slope	4+	deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
rockfall	105	1865	RF11	B	1864+80	1866+00	6234	downslope	yes	5-25	<10	<100	50-200	unpredictable	Bxms	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
rockfall	105	1915	RF12	C	1915+20	1916+50	5162	downslope	no	unk(>25?)	<10	100-500	50-200	unpredictable	Bxmg	-	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	105	2134	RF18	C	2134+00	2134+50	1751, 3490, 5169, 5929	downslope	no	unk(5-25?)	10-100	<100	<50	unpredictable	Bxm	open_bedrock_slope	1-2	starting_zone	30-40	unk	-	no	no	no	no	no
rockfall	105	2328	RF29	B	2328+10	2329+10	6140	mid	yes	25+	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	3-4	path	>60	unk	disturbed	no	no	no	no	no
rockfall	105	2502	RF42	B	2499+50	2505+00	6094, 6095	downslope	yes	unk(5-25?)	<10	<100	500+	moderate	Bxmg	deciduous_trees	0-1	path	40-50	unk	denuded	yes	no	no	no	yes
rockfall	111	1553	RF02	C	1553+00	1554+00	3049, 5149	downalignment	no	5-25	<10	100-500	50-200	unpredictable	Bxv	open_soil_slope	0-1	below_deposition_zone	50-60	unk	disturbed	no	yes	no	no	yes
rockfall	111	1854	RF10	C	1853+30	1854+30	4816	downslope	no	unk(5-25?)	<10	100-500	50-200	unpredictable	Bxms	other	2-3	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
rockfall	111	1932	RF13	C	1931+80	1933+00	5162	downslope	no	0-1	<10	100-500	50-200	moderate	Bxmg	-	1-2	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	111	2548	RF46	A	2546+70	2548+30	5338, 5339	mid	yes	5-25	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	yes	yes
rockfall	117	2301	RF26	B	2300+20	2301+10	3559, 3560, 5946	downslope	yes	unk(5-25?)	10-100	100-500	50-200	unpredictable	Bxmg	other	4+	deposition_zone	>60	unk	undisturbed	yes	no	no	no	no
rockfall	123	2291	RF25	B	2290+60	2291+00	3531	upslope	yes	unk(1-5?)	10-100	<100	<50	unpredictable	Bxms	open_bedrock_slope	2-3	deposition_zone	>60	unk	denuded	no	no	yes	yes	yes
rockfall	123	2568	RF52	B	2564+70	2570+60	6105, 6106	downslope	yes	1-5	<10	100-500	500+	high	Bxmg	open_soil_slope	4+	path	>60	into_slide	disturbed	no	no	yes	no	yes
rockfall	129	1586	RF03	B	1584+50	1587+00	4259, 5873	mid	yes	5-25	<10	100-500	200-500	unpredictable	Bxv	single_channel	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	129	1763	RF09	A	1763+20	1763+80	3878	upalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	129	1935	RF14	B	1933+70	1953+00	5163, 5909 to 5911	downslope	yes	unk(5-25?)	<10	100-500	200-500	unpredictable	Bxmg	-	2-3	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	no
rockfall	129	1948	RF15	B	1946+80	1949+00	5163	-	yes	5-25	<10	100-500	200-500	unpredictable	Bxmg	other	4+	deposition_zone	>60	off_slide	disturbed	no	yes	no	no	yes
rockfall	129	2015	RF16	B	2015+00	2017+40	5052, 5053, 6240	upalignment	yes	unk(5-25?)	<10	100-500	200-500	unpredictable	Bxms	deciduous_trees	3-4	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
rockfall	129	2335	RF31	A	2334+70	2335+60	6144, 6145	mid	yes	5-25	<10	500-1000	50-200	unpredictable	Bxmg	single_channel	4+	deposition_zone	>60	unk	denuded	no	no	no	no	yes
rockfall	129	2454	RF36	B	2454+50	2455+00	3609, 5960	downslope	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	-	3-4	below_deposition_zone	>60	unk	denuded	no	yes	no	no	yes
rockfall	129	2481	RF39	B	2480+30	2481+50	6083, 6084	downslope	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	other	3-4	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	129	2495	RF41	C	2495+00	2505+00	5965, 6094, 6095	upalignment	yes	1-5	<10	100-500	500+	moderate	Bxmg	open_soil_slope	2-3	path	>60	into_slide	disturbed	no	no	no	no	yes

TABLE 5
ALL HAZARDS SORTED BY HAZARD TYPE AND ASCENDING HAZARD INDEX NUMBER (HIN)

Hazard Type	Hazard Index Number (HIN)	IRP 2006 Location	Hazard ID#	Geologic Hazard Rating System	IRP 2006 South Margin	IRP 2006 North Margin	Photo #	Bounds	Impact Alignment	Frequency (yrs)	Material Volume (CY)	Source Elevation (ft)	Alignment Exposure (ft)	Predictability	Source Material	Centerline Slope	Clast Size (ft)	Alignment Location	Slope Angle (degrees)	Slope Drainage	Vegetation	Tension Cracks	Seeps	Tilting Trees	Curving Trunks	Deciduous Trees
rockfall	129	2529	RF43	A	2528+00	2529+70	3648, 5969	downalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
rockfall	129	2537	RF45	A	2536+10	2537+80	6098, 6099	downalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	-	1-2	deposition_zone	40-50	unk	-	no	no	no	no	no
rockfall	135	2332	RF30	B	2331+40	2332+80	6142, 6143	mid	no	5-25	10-100	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
rockfall	147	1549	RF01	C	1549+00	1552+50	4212, 4214, 5148	upalignment	no	1-5	<10	100-500	200-500	unpredictable	Bxv	open_soil_slope	3-4	below_deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
rockfall	147	2154	RF21	C	2154+00	2155+00	6014	-	no	1-5	<10	500-1000	50-200	unpredictable	Bxmg	-	2-3	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
rockfall	147	2254	RF22	B	2253+30	2253+80	5941, 6024	mid	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	single_channel	1-2	path	50-60	into_slide	disturbed	no	no	no	no	no
rockfall	147	2256	RF23	B	2254+90	2258+10	3505	downslope	yes	unk(1-5?)	<10	100-500	200-500	unpredictable	Bxmg	other	0-1	deposition_zone	>60	unk	disturbed	no	no	no	no	no
rockfall	147	2260	RF24	C	2258+90	2261+00	3507	downslope	no	unk(1-5?)	<10	100-500	200-500	unpredictable	Bxmg	-	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	147	2487	RF40	B	2484+00	2488+70	5182, 5964, 6085,	downslope	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	-	3-4	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
rockfall	147	2531	RF44	B	2531+00	2533+20	1565, 5326, 5327	downslope	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	no
rockfall	147	2558	RF50	B	2557+80	2558+40	3661, 3662, 3664	upalignment	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	2-3	path	>60	unk	disturbed	no	no	no	no	yes
rockfall	147	2560	RF51	B	2559+30	2560+50	3661, 3662, 3664	mid	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	2-3	path	>60	unk	disturbed	no	no	no	no	yes
rockfall	165	2145	RF20	A	2144+60	2146+80	1357, 3491, 3493, 3495, 3498, 5130, 5131, 5168	downslope	yes	1-5	<10	500-1000	200-500	unpredictable	Bxmg	fan	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	165	2308	RF27	B	2303+50	2308+40	3561	mid	yes	1-5	<10	500-1000	200-500	unpredictable	Bxmg	fan	2-3	deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
rockfall	177	2383	RF34	B	2382+50	2388+50	3712, 3715	upalignment	no	25+	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	4+	below_deposition_zone	>60	unk	undisturbed	no	no	no	no	yes
rockfall	183	1609	RF04	B	1605+50	1611+10	4245, 4246, 4247, 4249	downslope	yes	unk(5-25?)	<10	100-500	500+	unpredictable	Bxv	open_soil_slope	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	183	1730	RF06	A	1729+90	1730+80	4674, 6206	mid	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	open_bedrock_slope	3-4	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	183	1759	RF08	A	1759+30	1767+00	5157, 5039, 5040, 5041, 6209	upalignment	yes	5-25	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	no
rockfall	183	2322	RF28	A	2322+10	2322+70	3891, 5948, 6254	downslope	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	single_channel	1-2	path	>60	unk	disturbed	no	yes	no	no	yes
rockfall	183	2388	RF35	B	2388+00	2388+80	3706	downslope	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	0-1	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	183	2550	RF47	B	2549+80	2556+30	3660	downslope	yes	5-25	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	201	2129	RF17	A	2129+00	2130+00	5928, 6251	upalignment	yes	1-5	<10	1000-2000	50-200	unpredictable	Bxmg	open_soil_slope	3-4	path	50-60	unk	disturbed	no	no	no	no	yes
rockfall	201	2370	RF32	B	2361+10	2364+20	3724, 3725	downalignment	yes	0-1	<10	100-500	200-500	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	201	2557	RF49	C	2556+50	2562+00	3661, 3662, 3664	downslope	no	1-5	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	2-3	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	201	2620	RF53	A	2618+90	2626+00	3683, 3684	downalignment	yes	25+	100-1000	100-500	500+	unpredictable	Bxmg	fan	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	255	2365	RF33	B	2364+20	2370+50	3724, 3725	downslope	yes	0-1	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	273	2144	RF19	A	2142+70	2150+30	1357, 3491, 3493, 3495, 3498, 5130, 5168	mid	yes	1-5	<10	3000+	500+	unpredictable	Bxmg	fan	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
rockfall	279	1734	RF07	A	1724+80	1739+80	4674	upslope	yes	0-1	10-100	500-1000	500+	unpredictable	Bxmg	open_bedrock_slope	4+	deposition_zone	>60	into_slide	disturbed	no	no	no	no	yes
soil_raveling	105	2420	SR04	B	2420+70	2426+80	3595 to 3598, 5957, 6061	upalignment	yes	5-25	<10	<100	500+	moderate	Qc	open_soil_slope	3-4	path	40-50	into_slide	disturbed	no	no	no	yes	no
soil_raveling	147	2265	SR03	B	2263+50	2267+40	5579, 5580, 5581	mid	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	open_bedrock_slope	2-3	path	50-60	unk	disturbed	no	no	no	no	yes
soil_raveling	171	2042	SR01	B	2043+40	2050+10	5090, 5166, 6244	upalignment	yes	0-1	<10	<100	500+	high	Qc	open_soil_slope	1-2	path	40-50	off_slide	disturbed	no	no	no	no	yes
soil_raveling	171	2130	SR02	B	2129+40	2129+80	3889, 5168	upalignment	yes	0-1	<10	<100	<50	unpredictable	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	yes	yes	yes
translational_slide	33	2426	LS04	B	2426+80	2427+40	3595, 3597, 3598, 6074	upalignment	yes	5-25	<10	<100	50-200	moderate	Qc	open_soil_slope	3-4	path	40-50	into_slide	disturbed	no	no	yes	yes	no
translational_slide	111	2300	LS03	C	2299+10	2299+60	5269, 5946	mid	no	25+	10-100	100-500	50-200	unpredictable	Qc	-	1-2	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
translational_slide	129	2457	LS05	C	2456+00	2458+00	3615, 5961, 6077	upslope	no	5-25	<10	100-500	200-500	unpredictable	Qct	-	3-4	below_deposition_zone	30-40	unk	disturbed	no	no	no	yes	yes
translational_slide	135	2220	LS02	C	2219+60	2221+00	5000, 5937	mid	no	1-5	10-100	100-500	50-200	unpredictable	Qc	-	0-1	below_deposition_zone	50-60	unk	denuded	no	no	yes	no	yes

TABLE 6
ALL HAZARDS SORTED BY ASCENDING HAZARD INDEX NUMBER (HIN) AND ASCENDING IRP 2006 LOCATION

Hazard Index Number (HIN)	Hazard Index Number Weighting					IRP 2006 Location	Hazard Type	Hazard ID#	Geologic Hazard Rating System	IRP 2006 South Margin	IRP 2006 North Margin	Photo #	Bounds	Impact Alignment	Frequency (yrs)	Material Volume (CY)	Source Elevation (ft)	Alignment Exposure (ft)	Predictability	Source Material	Centerline Slope	Clast Size (ft)	Alignment Location	Slope Angle (degrees)	Slope Drainage	Vegetation	Tension Cracks	Seeps	Tilting Trees	Curving Trunks	Deciduous Trees
	Frequency	Quantity	Source	Length at Risk (ft)	Predictability																										
33	9	3	3	9	9	2426	translational_slide	LS04	B	2426+80	2427+40	3595, 3597, 3598, 6074	upalignment	yes	5-25	<10	<100	50-200	moderate	Qc	open_soil_slope	3-4	path	40-50	into_slide	disturbed	no	no	yes	yes	no
33	9	3	9	9	3	2473	rockfall	RF38	B	2473+00	2474+00	6092	mid	yes	5-25	<10	100-500	50-200	high	Bxmg	single_channel	1-2	path	>60	into_slide	disturbed	no	no	yes	no	yes
51	9	3	27	9	3	2207	debris_flow	DF32	B	2206+60	2207+20	6018	downalignment	yes	5-25	<10	500-1000	50-200	high	Qc	single_channel	0-1	path	40-50	into_slide	disturbed	no	no	no	no	yes
63	9	9	27	9	9	2563	debris_flow	DF43	A	2563+30	2564+10	5356	downalignment	yes	5-25	10-100	500-1000	50-200	moderate	Qct	single_channel	1-2	path	50-60	into_slide	denuded	no	no	no	no	yes
69	27	3	9	27	3	2467	rockfall	RF37	B	2466+10	2470+00	3637, 5181, 5962	upalignment	yes	1-5	<10	100-500	200-500	high	Bxmg	open_soil_slope	4+	path	>60	into_slide	disturbed	no	no	no	no	yes
81	27	9	27	9	9	2261	rock_slide	RS02	A	2261+10	2261+80	3508, 3510, 3511	mid	yes	1-5	10-100	500-1000	50-200	moderate	Bxmg	single_channel	1-2	path	50-60	into_slide	disturbed	no	no	no	no	no
93	3	3	3	3	81	2518	hazard_rock	HR03	C	2517+80	-	5311, 5312	downslope	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	-	4+	below_deposition_zone	40-50	-	-	no	no	no	no	no
93	3	3	3	3	81	2526	hazard_rock	HR04	C	2526+00	-	5318	-	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	-	4+	below_deposition_zone	40-50	-	-	no	no	no	no	no
93	3	3	3	3	81	2554	hazard_rock	HR05	C	2554+30	-	5362, 5363	-	yes	unk(>25?)	<10	<100	<50	unpredictable	Qct	open_soil_slope	4+	below_deposition_zone	-	-	-	no	no	no	no	no
99	3	9	3	3	81	2374	hazard_rock	HR01	C	2374+90	-	3722	upalignment	yes	unk(>25?)	10-100	<100	<50	unpredictable	Qct	open_soil_slope	4+	below_deposition_zone	40-50	unk	undisturbed	no	no	no	no	no
99	3	3	3	9	81	2380	hazard_rock	HR02	C	2379+40	2380+90	3719	upslope	yes	unk(>25?)	<10	<100	50-200	unpredictable	Qct	open_soil_slope	4+	deposition_zone	40-50	unk	disturbed	no	no	no	no	no
105	9	3	3	9	81	1657	rockfall	RF05	B	1657+00	1658+00	1086, 3904 to 3908, 5154, 6266	upalignment	yes	5-25	<10	<100	50-200	unpredictable	Bxv	open_bedrock_slope	4+	deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
105	9	3	3	9	81	1865	rockfall	RF11	B	1864+80	1866+00	6234	downslope	yes	5-25	<10	<100	50-200	unpredictable	Bxms	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
105	3	3	9	9	81	1915	rockfall	RF12	C	1915+20	1916+50	5162	downslope	no	unk(>25?)	<10	100-500	50-200	unpredictable	Bxmg	-	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
105	9	9	3	3	81	2134	rockfall	RF18	C	2134+00	2134+50	1751, 3490, 5169, 5929	downslope	no	unk(5-25?)	10-100	<100	<50	unpredictable	Bxm	open_bedrock_slope	1-2	starting_zone	30-40	unk	-	no	no	no	no	no
105	3	3	9	9	81	2328	rockfall	RF29	B	2328+10	2329+10	6140	mid	yes	25+	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	3-4	path	>60	unk	disturbed	no	no	no	no	no
105	9	3	3	81	9	2420	soil_raveling	SR04	B	2420+70	2426+80	3595 to 3598, 5957, 6061	upalignment	yes	5-25	<10	<100	500+	moderate	Qc	open_soil_slope	3-4	path	40-50	into_slide	disturbed	no	no	no	yes	no
105	9	3	3	81	9	2502	rockfall	RF42	B	2499+50	2505+00	6094, 6095	downslope	yes	unk(5-25?)	<10	<100	500+	moderate	Bxmg	deciduous_trees	0-1	path	40-50	unk	denuded	yes	no	no	no	yes
111	9	3	9	9	81	1553	rockfall	RF02	C	1553+00	1554+00	3049, 5149	downalignment	no	5-25	<10	100-500	50-200	unpredictable	Bxv	open_soil_slope	0-1	below_deposition_zone	50-60	unk	disturbed	no	yes	no	no	yes
111	9	9	81	9	3	1752	debris_flow	DF12	A	1751+00	1752+00	4738, 4739, 5157	mid	yes	5-25	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
111	3	9	81	9	9	1773	debris_flow	DF14	A	1772+50	1773+60	2093, 4714	downalignment	yes	25+	10-100	>1000	50-200	moderate	Qc	single_channel	2-3	path	30-40	into_slide	disturbed	no	no	no	no	no
111	9	3	9	9	81	1854	rockfall	RF10	C	1853+30	1854+30	4816	downslope	no	unk(5-25?)	<10	100-500	50-200	unpredictable	Bxms	other	2-3	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
111	81	3	9	9	9	1932	rockfall	RF13	C	1931+80	1933+00	5162	downslope	no	0-1	<10	100-500	50-200	moderate	Bxmg	-	1-2	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
111	9	9	81	9	3	2142	debris_flow	DF31	A	2140+50	2142+30	5168, 5169, 5929, 5930	downalignment	yes	5-25	10-100	3000+	50-200	high	Qc	multi_channel	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
111	3	9	9	9	81	2300	translational_slide	LS03	C	2299+10	2299+60	5269, 5946	mid	no	25+	10-100	100-500	50-200	unpredictable	Qc	-	1-2	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
111	9	3	9	9	81	2548	rockfall	RF46	A	2546+70	2548+30	5338, 5339	mid	yes	5-25	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	yes	yes
117	9	9	81	9	9	1670	debris_flow	DF04	B	1668+50	1670+50	3875	downalignment	yes	5-25	10-100	1000-2000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
117	9	9	81	9	9	2038	debris_flow	DF23	A	2041+20	2042+70	5057, 5166	upalignment	yes	5-25	10-100	3000+	50-200	moderate	Qc	multi_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
117	9	9	9	9	81	2301	rockfall	RF26	B	2300+20	2301+10	3559, 3560, 5946	downslope	yes	unk(5-25?)	10-100	100-500	50-200	unpredictable	Bxmg	other	4+	deposition_zone	>60	unk	undisturbed	yes	no	no	no	no
117	9	9	81	9	9	2491	debris_flow	DF42	B	2490+70	2491+30	6086	downslope	yes	5-25	10-100	1000-2000	50-200	moderate	Qc	single_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
123	27	3	81	9	3	1894	debris_flow	DF21	B	1893+30	1894+40	5161, 6238	downalignment	yes	1-5	<10	2000-3000	50-200	high	Qc	single_channel	0-1	path	30-40	into_slide	disturbed	no	no	no	no	yes
123	27	9	3	3	81	2291	rockfall	RF25	B	2290+60	2291+00	3531	upslope	yes	unk(1-5?)	10-100	<100	<50	unpredictable	Bxms	open_bedrock_slope	2-3	deposition_zone	>60	unk	denuded	no	no	yes	yes	yes
123	27	3	9	81	3	2568	rockfall	RF52	B	2564+70	2570+60	6105, 6106	downslope	yes	1-5	<10	100-500	500+	high	Bxmg	open_soil_slope	4+	path	>60	into_slide	disturbed	no	no	yes	no	yes
129	27	3	81	9	9	1515	debris_flow	DF02	A	1514+50	1515+50	1515, 2036, 5865	upalignment	yes	1-5	<10	2000-3000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
129	9	3	9	27	81	1586	rockfall	RF03	B	1584+50	1587+00	4259, 5873	mid	yes	5-25	<10	100-500	200-500	unpredictable	Bxv	single_channel	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
129	27	9	81	9	3	1674	debris_flow	DF05	A	1673+80	1675+30	6203, 6204	upalignment	yes	1-5	10-100	1000-2000	50-200	high	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	denuded	no	no	no	no	no
129	27	9	81	9	3	1720	debris_flow	DF08	A	1719+90	1720+80	1126, 5156	upslope	yes	1-5	10-100	>1000	50-200	high	Qc	fan	1-2	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
129	27	9	81	9	3	1743	debris_flow	DF10	A	1742+50	1743+40	4745 to 4748	mid	yes	1-5	10-100	>1000	50-200	high	Qc	multi_channel	0-1	path	40-50	into_slide	denuded	no	no	no	no	no
129	27	9	81	9	3	1748	debris_flow	DF11	A	1746+40	1748+20	4741, 4742, 5157	downalignment	yes	1-5	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
129	27	9	81	9	3	1757	debris_flow	DF13	A	1756+10	1757+50	4736, 4737, 5157	downalignment	yes	1-5	10-100	>1000	50-200	high	Qc	fan	2-3	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
129	27	3	9	9	81	1763	rockfall	RF09	A	1763+20	1763+80	3878	upalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
129	9	3	9	27	81	1935	rockfall	RF14	B	1933+70	1953+00	5163, 5909 to 5911	downslope	yes	unk(5-25?)	<10	100-500	200-500	unpredictable	Bxmg	-	2-3	below_deposition_zone	50-60	unk	disturbed	no	no	no	no	no
129	9	3	9	27	81	1948	rockfall	RF15	B	1946+80	1949+00	5163	-	yes	5-25	<10	100-500	200-500	unpredictable	Bxmg	other	4+	deposition_zone	>60	off_slide	disturbed	no	yes	no	no	yes
129	9	3	9	27	81	2015	rockfall	RF16	B	2015+00	2017+40	5052, 5053, 6240	upalignment	yes	unk(5-25?)	<10	100-500	200-500	unpredictable	Bxms	deciduous_trees	3-4	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
129	9	3	81	27	9	2055	debris_flow	DF25	B	2056+50	2059+00	3462, 3463, 5093, 6195	upalignment	yes	5-25	<10	3000+	200-500	moderate	Qc	fan	0-1	deposition_zone	>60	into_slide	disturbed	no	no	no	no	no
129	27	9	81	9	3	2056	debris_flow	DF26	B	2059+00	2060+50	2241, 3470, 6195	upalignment	yes	1-5	10-100	3000+	200-500	high	Qc	fan	0-1	deposition_zone	50-60	-	disturbed	no	no	no	no	yes
129	9	3	81	9	27	2088	debris_flow	DF27	B	2088+00	2089+00	3885, 5167, 5924, 6247	upalignment	yes	5-25	<10	2000-3000	50-200	low	Qc	open_soil_slope	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	no	no	yes
129	27	9	81	9	3	2310	debris_flow	DF36	B	2311+10	2311+80	3562	mid	yes	1-5	10-100	1000-2000	50-200	high	Qc	fan	0-1	path	>60	into_slide	denuded	no	no	no	no	yes
129	27	9	81	9	3	2321	debris_flow	DF37	B	2321+20	2322+10	3564, 3565, 3566	upalignment	yes	1-5	10-100	1000-2000	50-200	high	Qc	fan	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
129	9	3	27	9	81	2335	rockfall	RF31	A	2334+70	2335+60	6144, 6145	mid	yes	5-25	<10	500-1000	50-200	unpredictable	Bxmg	single_channel	4+	deposition_zone	>60	unk	denuded	no	no	no	no	yes
129	27	9	81	9	3	2338	debris_flow	DF38	A	2338+00	2338+90	6146	mid	yes	1-5	10-100	2000-3000	50-200	high	Qc	single_channel	0-1	path	40-50	into_slide	denuded	no	no	no	no	no
129	27	3	9	9	81	2454	rockfall	RF36	B	2454+50	2455+00	3609, 5960	downslope	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	-	3-4	below_deposition_zone	>60	unk	denuded	no	yes	no	no	yes
129	9	3	9	27	81	2457	translational_slide	LS05	C	2456+00	2458+00	3615, 5961, 6077	upslope	no	5-25	<10	100-500	200-500	unpredictable	Qct	-	3-4	below_deposition_zone	30-40	unk	disturbed	no	no	no	yes	yes
129	27	9	81	9	3	2460	debris_flow	DF41	B	2460+40	2461+00	3616	mid	yes	1-5	10-100	3000+	50-200	high	Qc	fan	0-1	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
129	27	3	9	9	81	2481	rockfall	RF39	B	2480+30	2481+50	6083, 6084	downslope	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	other	3-4	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
129	27	3	9	81	9	2495	rockfall	RF41	C	2495+00	2505+00	5965, 6094, 6095	upalignment	yes	1-5	<10	100-500	500+	moderate	Bxmg	open_soil_slope	2-3	path	>60	into_slide	disturbed	no	no	no	no	yes
129	27	3	9	9	81	2529	rockfall	RF43	A	2528+00	2529+70	3648, 5969	downalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
129	27	3	9	9	81	2537	rockfall	RF45	A	2536+10	2537+80	6098, 6099	downalignment	yes	1-5	<10	100-500	50-200	unpredictable	Bxmg	-	1-2	deposition_zone	40-50	unk	-	no	no	no	no	no
129	3	9	27	9	81	2552	landslide	LS06	C	2552+80	2554+00	5185, 5341, 5342	mid	no	unk(>25?)	10-100	500-1000	50-200	unpredictable	-	open_soil_slope	-	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
129	3	9	27	9	81	2561	landslide	LS07	C	2561+80	2562+80	5024	mid	no	unk(>25?)	10-100	500-1000	50-200	unpredictable	Qct	open_soil_slope	-	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
135	9	9	81	9	27	2123	debris_flow	DF30	B	2123+00	2123+90	5168, 5927, 6250	downalignment	yes	5-25	10-100	1000-2000	50-200	low	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	no	no	yes
135	27	9	9	9	81	2220	translational_slide	LS02	C	2219+60	2221+00	5000, 5937	mid	no	1-5	10-100	100-500	50-200	unpredictable	Qc	-	0-1	below_deposition_zone	50-60	unk	denuded	no	no	yes	no	yes
135	9	9	27	9	81	2332	rockfall	RF30	B	2331+40	2332+80	6142, 6143	mid	no	5-25	10-100	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
135	9	9	81	9	27	2459	debris_flow	DF40	B	2459+00	2459+90	3616, 5180, 5961	mid	yes	5-25	10-100	2000-3000	50-200	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	no
147	27	3	9	27	81	1549	rockfall	RF01	C	1549+00	1552+50	4212, 4214, 5148	upalignment	no	1-5	<10	100-500	200-500	unpredictable	Bxv	open_soil_slope	3-4	below_deposition_zone	>60	unk	disturbed	no	yes	no	no	yes
147	3	9	81	27	27	1824	debris_flow	DF17	B	1824+10	1825+50	1186, 4012, 4015, 5159, 6232,	upalignment	yes	25+	10-100	2000-3000	200-500	low	Qc	fan	1-2	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
147	27	9	81	27	3	1826	debris_flow	DF18	A	1825+50	1827+50	1186, 4012, 4015, 5159, 6232,	upalignment	yes	1-5	10-100	2000-3000	200-500	high	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
147	27	9	81	27	3	1984	debris_flow	DF22	A	1983+30	1985+70	5047, 5164, 5914	mid	yes	1-5	10-100	2000-3000	200-500	high	Qc	fan	1-2	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	no
147	27	3	27	9	81	2154	rockfall	RF21	C	2154+00	2155+00	6014	-	no	1-5	<10	500-1000	50-200	unpredictable	Bxmg	-	2-3	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	yes
147	27	3	27	9	81	2254	rockfall	RF22	B	2253+30	2253+80	5941, 6024	mid	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	single_channel	1-2	path	50-60	into_slide	disturbed	no	no	no	no	no
147	27	3	9	27	81	2256	rockfall	RF23	B	2254+90	2258+10	3505	downslope	yes	unk(1-5?)	<10	100-500	200-500	unpredictable	Bxmg	other	0-1	deposition_zone	>60	unk	disturbed	no	no	no	no	no
147	27	3	9	27	81	2260	rockfall	RF24	C	2258+90	2261+00	3507	downslope	no	unk(1-5?)	<10	100-500	200-500	unpredictable	Bxmg	-	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
147	27	3	9	27	81	2265	soil_raveling	SR03	B	2263+50	2267+40	5579, 5580, 5581	mid	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	open_bedrock_slope	2-3	path	50-60	unk	disturbed	no	no	no	no	yes
147	27	9	81	27	3	2281	debris_flow	DF34	B	2283+70	2287+10	3527, 3528	upalignment	yes	1-5	10-100	3000+	200-500	high	Qct	fan	1-2	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes
147	27	3	9	27	81	2487	rockfall	RF40	B	2484+00	2488+70	5182, 5964, 6085,	downslope	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	-	3-4	below_deposition_zone	>60	unk	disturbed	no	no	no	no	no
147	27	3	9	27	81	2531	rockfall	RF44	B	2531+00	2533+20	1565, 5326, 5327	downslope	yes	1-5	<10	100-500	200-500	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	no
147	27	3	27	9	81	2558	rockfall	RF50	B	2557+80	2558+40	3661, 3662, 3664	upalignment	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	2-3	path	>60	unk	disturbed	no	no	no	no	yes
147	27	3	27	9	81	2560	rockfall	RF51	B	2559+30	2560+50	3661, 3662, 3664	mid	yes	1-5	<10	500-1000	50-200	unpredictable	Bxmg	open_soil_slope	2-3	path	>60	unk	disturbed	no	no	no	no	yes
153	27	9	81	9	27	1733	debris_flow	DF09	A	1732+50	1734+40	3307	upslope	yes	unk(1-5?)	10-100	>1000	50-200	low	Qc	single_channel	1-2	path	40-50	into_slide	disturbed	no	no	no	no	yes
153	9	9	81	27	27	1847	debris_flow	DF19	A	1845+30	1849+90	4809, 4812, 4830, 5160	upalignment	yes	5-25	10-100	3000+	200-500	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
153	9	9	81	27	27	1852	debris_flow	DF20	B	1852+00	1853+10	1210, 5160	downalignment	yes	5-25	10-100	3000+	200-500	low	Qc	fan	0-1	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
153	27	9	81	27	9	2114	debris_flow	DF29	A	2115+00	2117+40	5125, 5926, 6248	upalignment	yes	1-5	10-100	3000+	200-500	moderate	Qc	fan	1-2	deposition_zone	>60	into_slide	denuded	no	no	no	no	yes
165	27	3	27	27	81	2145	rockfall	RF20	A	2144+60	2146+80	1357, 3491, 3493, 3495, 3498, 5130, 5131, 5168	downslope	yes	1-5	<10	500-1000	200-500	unpredictable	Bxmg	fan	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
165	27	3	27	27	81	2308	rockfall	RF27	B	2303+50	2308+40	3561	mid	yes	1-5	<10	500-1000	200-500	unpredictable	Bxmg	fan	2-3	deposition_zone	50-60	unk	disturbed	no	no	no	no	yes
171	27	27	81	27	9	1704	debris_flow	DF07	A	1701+50	1705+50	4366, 5155	upalignment	yes	1-5	100-1000	>1000	200-500	moderate	Qc	multi_channel	1-2	deposition_zone	30-40	Into_slide	denuded	no	no	no	no	yes
171	81	3	3	81	3	2042	soil_raveling	SR01	B	2043+40	2050+10	5090, 5166, 6244	upalignment	yes	0-1	<10	<100	500+	high	Qc	open_soil_slope	1-2	path	40-50	off_slide	disturbed	no	no	no	no	yes
171	81	3	3	3	81	2130	soil_raveling	SR02	B	2129+40	2129+80	3889, 5168	upalignment	yes	0-1	<10	<100	<50	unpredictable	Qc	single_channel	0-1	deposition_zone	30-40	into_slide	disturbed	no	no	yes	yes	yes
177	3	3	9	81	81	2383	rockfall	RF34	B	2382+50	2388+50	3712, 3715	upalignment	no	25+	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	4+	below_deposition_zone	>60	unk	undisturbed	no	no	no	no	yes
183	81	3	81	9	9	1517	debris_flow	DF03	A	1517+00	1518+20	3893, 5148, 5865, 6256	upalignment	yes	0-1	<10	2000-3000	50-200	moderate	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
183	9	3	9	81	81	1609	rockfall	RF04	B	1605+50	1611+10	4245, 4246, 4247, 4249	downslope	yes	unk(5-25?)	<10	100-500	500+	unpredictable	Bxv	open_soil_slope	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
183	81	3	9	9	81	1730	rockfall	RF06	A	1729+90	1730+80	4674, 6206	mid	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	open_bedrock_slope	3-4	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
183	9	3	9	81	81	1759	rockfall	RF08	A	1759+30	1767+00	5157, 5039, 5040, 5041, 6209	upalignment	yes	5-25	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	no
183	81	9	81	9	3	2104	debris_flow	DF28	A	2102+30	2103+70	3886, 5916	downalignment	yes	0-1	10-100	3000+	50-200	high	Qc	fan	3-4	deposition_zone	50-60	into_slide	denuded	no	no	no	no	yes

TABLE 6
ALL HAZARDS SORTED BY ASCENDING HAZARD INDEX NUMBER (HIN) AND ASCENDING IRP 2006 LOCATION

Hazard Index Number (HIN)	Hazard Index Number Weighting					IRP 2006 Location	Hazard Type	Hazard ID#	Geologic Hazard Rating System	IRP 2006 South Margin	IRP 2006 North Margin	Photo #	Bounds	Impact Alignment	Frequency (yrs)	Material Volume (CY)	Source Elevation (ft)	Alignment Exposure (ft)	Predictability	Source Material	Centerline Slope	Clast Size (ft)	Alignment Location	Slope Angle (degrees)	Slope Drainage	Vegetation	Tension Cracks	Seeps	Tilting Trees	Curving Trunks	Deciduous Trees
	Frequency	Quantity	Source	Length at Risk (ft)	Predictability																										
183	9	9	81	3	81	2205	landslide	LS01	C	2204+00	2208+00	5171	-	no	unk(>25?)	10-100	1000-2000	<50	unpredictable	Bxmg	-	-	below_deposition_zone	40-50	unk	disturbed	no	no	no	no	no
183	9	9	81	3	81	2250	debris_flow	DF33	B	2252+50	2252+80	6023	mid	yes	unk(5-25?)	10-100	3000+	<50	unpredictable	Qc	single_channel	1-2	path	40-50	into_slide	denuded	no	no	no	no	no
183	81	3	9	9	81	2322	rockfall	RF28	A	2322+10	2322+70	3891, 5948, 6254	downslope	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	single_channel	1-2	path	>60	unk	disturbed	no	yes	no	no	yes
183	81	3	9	9	81	2388	rockfall	RF35	B	2388+00	2388+80	3706	downslope	yes	0-1	<10	100-500	50-200	unpredictable	Bxmg	open_soil_slope	0-1	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
183	9	3	9	81	81	2550	rockfall	RF47	B	2549+80	2556+30	3660	downslope	yes	5-25	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	2-3	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
201	81	9	81	27	3	1678	debris_flow	DF06	A	1677+00	1679+00	3876	downalignment	yes	0-1	10-100	2000-3000	200-500	high	Qc	fan	0-1	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
201	27	3	81	9	81	2129	rockfall	RF17	A	2129+00	2130+00	5928, 6251	upalignment	yes	1-5	<10	1000-2000	50-200	unpredictable	Bxmg	open_soil_slope	3-4	path	50-60	unk	disturbed	no	no	no	no	yes
201	81	3	9	27	81	2370	rockfall	RF32	B	2361+10	2364+20	3724, 3725	downalignment	yes	0-1	<10	100-500	200-500	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
201	27	3	9	81	81	2557	rockfall	RF49	C	2556+50	2562+00	3661, 3662, 3664	downslope	no	1-5	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	2-3	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
201	3	27	9	81	81	2620	rockfall	RF53	A	2618+90	2626+00	3683, 3684	downalignment	yes	25+	100-1000	100-500	500+	unpredictable	Bxmg	fan	4+	below_deposition_zone	>60	unk	disturbed	no	no	no	no	yes
207	9	81	81	27	9	1782	debris_flow	DF15	B	1782+00	1783+00	3912	-	yes	5-25	1000+	>1000	200-500	moderate	Qc	multi_channel	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
207	27	9	81	81	9	2054	debris_flow	DF24	B	2054+40	2056+50	2054, 2239, 3462, 3463, 5093, 6195	upalignment	yes	1-5	10-100	3000+	50-200	high	Qc	multi_channel	1-2	deposition_zone	40-50	into_slide	denuded	no	no	no	no	yes
207	27	9	81	9	81	2296	debris_flow	DF35	B	2293+80	2294+90	3535	downalignment	yes	unk(1-5?)	10-100	3000+	50-200	unpredictable	Qct	fan	3-4	deposition_zone	>60	into_slide	disturbed	no	no	no	no	yes
219	3	27	81	27	81	1522	rock_slide	RS01	A	1521+80	1525+50	4123, 4124, 4126, 5148, 5865	-	no	unk(>25?)	100-1000	>1000	200-500	unpredictable	Bxv	open_bedrock_slope	4+	deposition_zone	60+	unk	denuded	yes	no	no	no	no
225	27	27	81	81	9	1493	debris_flow	DF01	A	1492+90	1498+90	4098, 4099, 5146	-	yes	1-5	100-1000	>1000	500+	moderate	Qc	fan	1-2	deposition_zone	30-40	into_slide	denuded	other	no	no	no	yes
225	27	81	81	27	9	1783	debris_flow	DF16	A	1783+00	1785+30	1141, 2091, 5158	upalignment	yes	1-5	1000+	>1000	200-500	moderate	Qc	multi_channel	2-3	deposition_zone	40-50	into_slide	disturbed	no	no	no	no	yes
255	81	3	9	81	81	2365	rockfall	RF33	B	2364+20	2370+50	3724, 3725	downslope	yes	0-1	<10	100-500	500+	unpredictable	Bxmg	open_soil_slope	1-2	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
273	27	3	81	81	81	2144	rockfall	RF19	A	2142+70	2150+30	1357, 3491, 3493, 3495, 3498, 5130, 5168	mid	yes	1-5	<10	3000+	500+	unpredictable	Bxmg	fan	4+	deposition_zone	>60	unk	disturbed	no	no	no	no	yes
279	81	9	27	81	81	1734	rockfall	RF07	A	1724+80	1739+80	4674	upslope	yes	0-1	10-100	500-1000	500+	unpredictable	Bxmg	open_bedrock_slope	4+	deposition_zone	>60	into_slide	disturbed	no	no	no	no	yes

SOURCES USED:

-All photos are taken by Michael Miller and friends, and used in combination with the Geological Hazard Maps (Zone 4), to the best of their knowledge.

-Geological Hazard Maps (Zone 4) and terminology were taken from the Golder Associates Manual (Dec. 2006)

-Topo maps used: Geological Survey Control by USGS and USC&GS

-Environmental Impact Statement from the DOT. State Project # 71100. Appendix J: Snow Avalanche

